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ICW/80/09

September 15, 1980

FROM: The Secretariat

Consultative Group Meeting

October 1980

Report on the Stripe Analysis of the Off-Campus Activities of the International Agricultural Research Centers

Agenda Item No. 10

At the request of the Group the TAC has recently completed a study of off-campus activities being undertaken by the international agricultural research centers. A copy of the report entitled "Report on the Stripe Analysis of the Off-Campus Activities of the International Agricultural Research Centers" (AGD/TAC:IAR/80/22 Rev. 2) is attached for the information of CG members and others attending the Consultative Group Meeting at Manila starting October 30. Also attached is a Compendium listing the details of the various off-campus activities (AGD/TAC:IAR/80/22: Add. 1).

The report and Compendium will be considered under Agenda Item 10 of the meeting.

Attachment

Distribution:

CG Members
TAC Members
TAC Secretariat
Center Board Chairmen
Center Directors

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

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July 23, 1980

Mr. Warren C. Baum
Chairman
Consultative Group on International
Agricultural Research
1818 H Street, N. W.
Washington, D. C. 20433

Dear Mr. Baum:

I am pleased to transmit herewith the report of the stripe review of off-campus activities of the IARC's. In conducting this review, the TAC Secretariat assembled information which was available on the subject from the IARC annual reports and programme and budget documents. This was followed by a request to each IARC for a listing, classification, and rationale for their various off-campus activities. With this in hand, TAC decided to concentrate its detailed analyses on the off-campus activities of the six centers which had the longest history and most extensive programmes away from their headquarters locations. Three consultants--R. F. Chandler, Fred Haworth, and Almiro Blumenschein--made field visits to the concerned centers and selected off-campus work in Asia, Africa, and Latin America, respectively.

A combined report prepared by the consultants and the Executive Secretary of TAC, in joint sessions, was used as the basic discussion document for a workshop held at CIMMYT Headquarters on June 25-27, 1980, in which TAC members, IARC representatives, CGIAR members, and selected scientists from LDC organizations participated. The results of this workshop were then discussed in a joint session of TAC and all IARC directors during the 24th meeting of the TAC in Lima, Peru.

The attached report, finalized after this latter discussion, is in two parts. The first part consists of the classification and analysis of the off-campus activities of the IARC's, with pertinent observations and conclusions coming out of the study. The second part is a compendium which attempts to list and describe in a concise form the off-campus activities of all centers included in the CGIAR system as of June, 1980.

../.

The report is being distributed to all CGIAR members. We trust that it will prove useful to them. We shall anticipate its discussion by the Group at the forthcoming CGIAR meetings in Manila.

Very truly yours,

Ralph W. Cummings

Ralph W. Cummings
Chairman, TAC

RWC/ehu
Enclosure

AGD/TAC:IAR/80/22 Rev. 2
Restricted

THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

Twenty-Fourth Meeting, Lima (Peru) - 1-8 July 1980

REPORT ON THE STRIPE ANALYSIS OF THE OFF-CAMPUS ACTIVITIES OF THE INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

June 1980

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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28 June 1980

Dr. Ralph W. Cummings
Chairman
Technical Advisory Committee to
the CGIAR
812 Rosemont Avenue
Raleigh, North Carolina 27607
U.S.A.

Dear Dr. Cummings,

I am pleased to submit herewith the Report on the Stripe Analysis of the Off-Campus Activities of the International Agricultural Research Centres.

As you know, this study was conducted by three Consultants, Dr. Fred Haworth, Dr. Almiro Blumenschein and myself. We divided the field work so that Dr. Haworth visited institutes and field programmes in Africa, Dr. Blumenschein covered the activities in Latin America and I visited the operations in Asia. These visits took place in April and early May 1980.

The Consultants, along with Mr. Philippe Mahler, the Executive Secretary of TAC, met in Washington, D.C., for five days in mid-May 1980 to prepare a draft report. This material was then put in more final form by the Secretariat of TAC in Rome. Later it was distributed to the Centre Directors and to the participants in a Workshop which was held at CIMMYT in Mexico from 25-28 June 1980.

Many of the suggestions of the Workshop participants have been incorporated in the report. However, responsibility for the content of the report rests with the Consultants.

/...

The Consultants found the off-campus activities of the International Agricultural Research Centres to be so diverse, depending upon their mandates and the range of environments in which they conduct their research, that it was impossible to make many recommendations that were equally applicable to all Centres. Nevertheless, we hope that this report will be helpful to TAC, and to the CGIAR members by providing a better understanding of the contribution that the off-campus activities are making toward the purposes for which the international centres were created.

Respectfully submitted,

Fred Haworth

Robert F. Chandler, Jr.

Almiro Blumenschein

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ACKNOWLEDGEMENTS

The Consultants are grateful for the invaluable assistance of the TAC Secretariat which provided both background material and advice and guidance during the preparation of this report. Furthermore, the office furnished excellent secretarial assistance in preparing both the first and final drafts of the report.

The cooperation of the administrators, scientists and field staff of the six centres which came under intensive study is gratefully acknowledged. Without their assistance this report could not have been prepared.

The Consultants extend their appreciation to the CGIAR Secretariat in the World Bank for providing space and secretarial help while the first draft of the report was being prepared from May 12-16, 1980.

The Consultants are deeply grateful to CIMMYT for providing full facilities for the Workshop on the Stripe Analysis of Off-Campus Activities of the IARCs, which was held at El Batan from June 25-28, 1980.

The Consultants acknowledge the many helpful suggestions of the participants in the Workshop. Although many of their ideas have been incorporated in the report, the responsibility for the content of the report rests with the Consultants.

Robert F. Chandler, Jr. Fred Haworth Almiro Blumenschein

1. INTRODUCTION

1. In 1977 the Consultative Group on International Agricultural Research decided to conduct across-centre analyses of specific categories of activities which are common to several of the international agricultural centres and other institutions which are supported by the Group, as a means to compare their different approaches and methodologies, and to assess their effectiveness. Although these analyses (called "stripe analyses") were not aimed at encouraging uniformity in a system which serves a wide diversity of regions and addresses an equally wide range of research problems, the stripe analyses were seen as a procedure which would help the centres and the members of the CGIAR in keeping the overall perspective of the system under review and supplement the evaluations which each individual centre undergoes periodically (internal review, quinquennial review, etc.). The organization and conduct of these stripe analyses was entrusted to TAC.

2. A first stripe analysis was carried out in 1977-78 and was devoted to a comparative assessment of the farming systems research programmes of several centres. When selecting the topic for the second analysis from a number of possible areas which deserved attention, the CGIAR agreed with the proposal of TAC that the activities which IARCs carry out outside their campus would merit priority examination for several reasons:

i) The off-campus activities of the IARCs were at that time, and still are, the fastest growing components in the CGIAR system and therefore those which require increasing resources from the Group. The IARCs requested that some of their activities which had been financed so far through special projects be incorporated in their core budgets, thus placing an additional demand on their continuing requirements from the CGIAR.

ii) Several centres were searching for new approaches which would permit them to face more efficiently the growing and very diverse demands of developing countries for cooperation and/or assistance, without overstretching their capacities, overloading their management, or overlapping with each other.

iii) An increased number of national agricultural research programmes had developed their capabilities to a point where they wished to establish different types of relationship with the IARCs.

iv) There was also a growing desire on the part of certain national programmes to cooperate not only with the IARCs but also with other national programmes in joint cooperative ventures and on an equal partnership basis.

v) Finally there was a growing realization that while several of the off-campus activities of the IARCs had been successful in strengthening certain sectors of agricultural research and certain areas of production, the effectiveness and the impact of the off-campus

activities was uneven from one country to another and from one region to another in a given country. A major question was, therefore, whether the IARCs should, in addition to their basic tasks of technology development and training, involve themselves in more thorough field studies of the constraints which limited the impact of their technologies. More generally, the appropriate role of the IARCs in support of technical assistance for agricultural research development as a whole required further consideration.

3. This stripe analysis was also considered timely because the CGIAR was in the course of establishing a new International Service for strengthening agricultural research in developing countries. This study was seen as a way of taking stock of the experience gained by the Centres in this field and helping to define what could be the respective roles of the IARCs and ISNAR in the future.

4. In the light of these questions the Technical Advisory Committee established the following terms of reference for the stripe analysis of the off-campus activities of the IARCs.

Terms of Reference

(1) As agreed by the Consultative Group on International Agricultural Research, TAC is to carry out a stripe analysis of the activities of the International Agricultural Research Centres which take place away from the main headquarters location of these Centres. The analysis will describe the nature of such activities, assess their quality and value, and examine their possible future direction. It will also identify and address any major issues which the CGIAR, and the International Centres should address in considering the future character and support of such activities.

(2) In particular, the analysis will:

a) determine the size, location, objectives, major responsibilities, planned duration and costs of current off-campus activities and those planned for 1980/81 of all CGIAR-sponsored International Centres and programmes - whether core or special project funded;

b) analyze and describe the principal functions of the off-campus programme related to national, regional and international responsibilities;

c) evaluate the effectiveness of such programmes in achieving the objectives set for them, and the value of these activities as perceived by the Centres, donors, the countries in which the programmes are carried out and other beneficiaries;

d) estimate the likely future development of such programmes in 1980 and 1981 as expected by centre management, donor agencies and beneficiary institutions;

e) identify issues, evaluate and make recommendations thereon, for consideration by TAC regarding the present and future size, direction of growth, administration and management, cost and functions of such activities. This should include consideration of prospects for possible collaborative arrangements among Centres and with ISNAR.

5. The procedures followed for the stripe analysis are presented in Annex A.

6. The terms of reference were supplemented by a list of questions which is given in Annex B.

2. CLASSIFICATION OF OFF-CAMPUS ACTIVITIES

2.1 Definitions

7. Off-campus activities are all activities which are carried out by IARCs at locations away from headquarters but excluding activities at sites within the host country which are an integral part of the central research programme.

8. Off-campus activities may comprise either core programmes or special projects which are defined below.

9. The core programme of a Centre or institute is a set of long-term activities designed to progress toward the Centre's fundamental objectives in research and training, as described in a basic statement approved by the Centre's governing board (which some Centres refer to as their "mandate"). So far as finance is concerned, the core programme is funded by several donors and is the major part of the total resources made available to the Centre. The hallmark of the core programme, as far as content is concerned, is that it represents the initiative of the Centre, carries the approval of the governing board and is meant to serve many developing countries.

10. The core programme need not be confined to the headquarters of an institute. A core programme may be carried out away from headquarters and outside the host country, by an institute's own staff, by contract with another research organization or laboratory, or by other cooperative arrangements with national or regional institutes.

11. Restricted core projects are those parts of a Centre's core programme to which individual donors direct the use of their contribution(s).

12. Special projects usually are highly specific in purpose, limited to a definite span of time and usually are confined in scope to one developing country only. They are often financed by a single donor, and may or may not be continued or renewed when the donor's support comes

to an end. They may be "on-campus" or "off-campus". While closely related to the Centre mandate, they lie outside of the core programme as defined in para 9.

13. In contrast to the content of a core programme, that of a special project is usually stipulated by the donor and/or by the client. The project usually consists, basically, of making practical use of a Centre's research results or of its expert staff. It may be conducted at the Centre's headquarters or in one or more countries (which may or may not be the Centre's host country).

14. An important class of special projects is composed of co-operative "off-campus" research and development projects. These typically are programmes of technical assistance by the personnel of an international institute to research or extension efforts in one developing country, usually carried out under a contract with the recipient country and financed by that country with the help of an outside donor or donors. Some off-campus activities have been initiated by the Centres as special projects and later proposed for incorporation in the Centre's core programme and budget. Thus, the particular interest which CG donors have in this stripe analysis for establishing guiding principles and criteria concerning the conditions under which special projects may become part of the core programmes.

2.2 The Mode of Classification

15. Categories of off-campus activities from the IARCs off-campus activities can be classified in several ways:

i) by their objectives and functions (e.g. data collection and problem identification, research, technology transfer, training, etc.);

ii) by their geographical scope, distinguishing between global programmes, regional programmes and national programmes;

iii) by their mode of funding (core or non-core) and the level of operational responsibility of the Centre.

16. Most of the off-campus activities as presented by the IARCs in their reply to the questionnaire do not constitute significantly distinct categories from the point of view of their objectives and functions and are closely associated with research, training and technology transfer programmes of the IARCs as a whole. On-campus and off-campus activities make a continuum in which categorization is necessarily arbitrary. A categorization by functions often does not permit the identification of the corresponding elements in the programme and budget of the Centre.

17. The classification by geographical scope or by the mode of funding and operational responsibility of the Centre enables a clearer identification of distinct categories. The differences between these categories, however, are less significant when analyzing their rationale

and their role. For example, the same staff member in a regional programme usually performs several functions ranging from data collection and research, to technology transfer, training and advisory services. Similarly, a national project usually includes several components of research, research support, on-farm trials, training, etc.

18. Seven main objectives were identified which explain why the IARCs carry out activities outside of their campus. An off-campus activity may have one or several of the following objectives:

i. The Centre wishes in cooperation with national programmes wherever possible to gather research material and information at national/regional level as a basis for selecting its priorities and establishing or reorientating its research programmes on a particular problem of general importance.

ii. The main headquarters facilities are not adequate or sufficient to carry out certain important aspects of the research programme of the Centre. Certain IARCs find it more cost-effective to sub-contract some parts of this research to advanced research institutions.

iii. The site of the IARCs campus is not representative of the whole range of environments and problems on which the Centre is working.

iv. It is not possible or desirable to move certain plant materials to the Centre for experimentation because of the risks of transference of serious diseases currently restricted to certain localities, or it is not advisable to work at the Centre on certain diseases which are of restricted distribution.

v. The Centre wishes to test and disseminate its technology, help national programmes in adapting and applying this technology, and have a feedback to its own research programme.

vi. The Centre receives requests from countries for assistance in particular topics or in the strengthening of the national agricultural research capacities in its field of competence.

vii. The Centre wishes to promote regional cooperation and strengthen links within its programme.

2.3 The Classification Used

19. Having considered the different ways of categorizing the off-campus activities by objectives, functions, geographical scope, funding and level of responsibility of the Centre, a pragmatic approach was finally chosen which comes as close as possible to most of the classification systems used by the Centres.

20. Three main broad types of off-campus activities were first identified. They correspond to the most common categories and also roughly follow the main sequence of "outreach" functions of the Centres by which they usually first undertake multi-locational testing in a large number of countries; then they assist some countries by means of special national projects to build up specific components of their research capabilities and to become active partners in international research, and they organize regional programmes of cooperation between those countries and continue to provide them with different kinds of services (material for testing, advisory services, etc.).

21. Other categories of off-campus activities are of a more diverse nature and include a whole range of activities which are sometimes associated with the three main categories listed above (as in the case of training) or are discrete elements sometimes of a limited scope and duration (i.e. germplasm collection missions).

22. The classification adopted is presented below:

a. International testing programmes
b. The national projects
c. The regional programmes
d. Core research programme outside the host country (with outposted staff)
e. Collaborative research projects (without outposted staff)
   i. with developing countries
   ii. with developed countries
f. Collection of information and data
g. Germplasm collection
h. Training and follow-up
i. Consultation to national programmes

23. For the reasons given in paras 16 and 17 it is realized that there is usually some overlap between the above categories. These will be clarified as they are reviewed in the following sections.

3. CATEGORIES OF OFF-CAMPUS ACTIVITIES

3.1 International Testing Programmes

24. All six of the Centres covered by the consultants' missions have substantial international testing programmes. As each IARC began its work, one of the earliest activities was to assemble a germplasm collection (see section 3.7). This included the more promising crop varieties that had been developed previously by national crop improvement programmes, as well as large numbers of varieties that were being grown by local farmers. The germplasm collection formed the basis of the breeding programme of each IARC.

25. A few years later, as promising new varieties or genetic lines emerged from the breeding programmes, the need arose to test these materials under a wide range of environments. Each Centre developed an international testing programme which is now a major activity of most of them. The largest screening and testing programmes are being conducted by CIMMYT, IRRI and ICRISAT, with smaller ones being carried out by CIAT, CIP and IITA, in about that order of decreasing magnitude.

26. The nature of the international testing nurseries varies with the mandates of the Centres. It covers a wide range of objectives from the initial screening of large numbers of relatively untested varieties or lines, through preliminary yield trials to advanced yield trials. Also many nurseries are designed to test varieties for tolerance or resistance to insect or disease attack, or to low or high temperatures or to drought. Some nurseries are designed to screen varieties for tolerance to adverse soil conditions such as zinc or phosphorous deficiency.

27. In spite of the specific objectives of each nursery, it can be said that the overall purpose of the programme is to identify genetic lines or cultivars that perform well under specific or a broad range of environmental conditions. An important secondary objective is to disseminate promising genetic material from which local institutions may select what is useful to them. From these tests plant breeders at the Centres and in the national programmes obtain excellent material for their crossing programmes. Another important contribution is that those scientists participating in the testing networks become well acquainted with each other during the Workshop and the monitoring tours which are organized to review the results and the programmes. Before the IARCs were established, there was inadequate communication among plant breeders. While there was some exchange of germplasm, this was not on a systematic basis and there was little follow-up activity.

28. WARDA has a similar ITP which is carried out on a sub-Regional network basis involving 13 countries with the work being done by the staff of the national programmes in each of the countries. This programme includes:

(i) Initial yield evaluation trials; for irrigated, rainfed and deep-flooded/floating conditions. Nominations to these trials include varieties developed at IRRI, IITA, CIAT, national programmes in Asia, South America and West Africa including WARDA itself.

(ii) Coordinated variety trials; these include entries identified from initial evaluation trials in different ecological conditions and of different durations of growth.

(iii) Coordinated crop protection trials for screening of insecticides and herbicides, under the various ecological conditions.

29. The international testing programme, which in its early stages is truly a screening programme, should not be confused with a multi-location breeding programme which is essentially a core programme activity outside the host country, (para 100).

30. In spite of the many positive attributes of the international testing programmes of the IARCs, a few critical comments have been voiced by cooperating scientists and administrators in the national programmes. In a number of cases the national scientists felt that the nurseries sent to them contained considerable material which was of little interest because it was not appropriate for the environment or local consumer preferences. These scientists felt that, had they been able to participate more fully in the selection of the materials to be included, much of the difficulty could have been avoided. Several Centres pointed out that mechanisms exist and are used by which national scientists can select materials for inclusion into nurseries for their respective countries. In addition, Centres respond to specific requests for genetic materials from other scientists.

31. In addition to greater participation by the cooperating national scientists, it would seem that this situation could be improved by making a more critical choice of varieties for a given ecological zone, thus making the material more suitable for the region and, at the same time, reducing the size of the nursery. This practice has been started by some of the Centres and is proving to be quite acceptable to the operators.

32. Administrators of agricultural programmes in the cooperating countries have been critical of the number and size of the nurseries that are located in their countries. They admit that this is not always the fault of the IARCs, but rather caused by over-enthusiasm on the part of their own cooperating scientists. This situation seems to be improving where the Centre has a regional programme and the regional representative can discuss more fully with both administrators and scientists in the region the composition and the size of the nurseries to be provided.

33. A few of the important problems that remain only partially solved in some countries and Centres are as follows:

a) There are problems of timely dispatch of seed as well as delays in freight and mail delivery and in passing materials through quarantine;

b) Too many trials are not well conducted (problems of timely planting, weed control, bird and rodent damage, poor data collection, and lack of returns of data to the Centres) and basic data on soil and growing conditions are not provided. Furthermore, all too often when low yields are obtained, no explanation for such poor results is given;

c) The processing of the data by the Centres and its dissemination to the cooperators is often overly delayed.

34. It is generally agreed among the national programme co-operators that the IARCs should not name varieties, but rather should

supply both early and advanced generations to the national programmes for testing and selection, with the national programmes having complete freedom to name any variety that they wish to.

35. Without question the international testing programmes have added greatly to the germplasm available to the national programmes and the operation as a whole can be considered as being highly successful. It is because of the distribution and testing of the products of the plant breeding programmes of IRRI and CIMMYT, for example, that many countries of South and South East Asia have been able to increase their rice and wheat production significantly.

3.2 The National Projects

3.2.1 Range of activities and their rationale

36. Activities of the IARCs at national level range from collaborative projects in which the IARC input is largely on a scientific interchange basis, to special projects in which the whole project is designed to build up national research competence and may be managed by a coordinator assigned by one of the Centres.

37. For the purposes of this section, only those projects in which IARC staff are posted to the country on a full-time basis using extra-core funds, are considered; those projects in which no staff are posted are discussed in Section 3.5.1.

38. Because of distinct differences in philosophies and operational procedures among the Centres, and the stage of development of the Centres and of the national programmes, it is not possible to consider the Centres as a whole in this component of the analysis. This section, therefore, contains a considerable number of examples to illustrate this diversity.

39. There are two main components in the CIAT off-campus programmes. Core staff are used in Regional services and these serve a number of countries having similar types of problems or needs. At the request of a country, CIAT appoints non-core special funded staff to work as components of national agricultural teams. Such staff are expected to work within the administrative structure of a national programme and within the boundaries of the country. Their service is regarded as being of a temporary nature to assist with the strengthening of the national institution in their field of activity while national staff are being trained to take over the work. CIAT is now involved in only two such projects in Guatemala and Peru on bean production.

40. It is the policy of CIP to work so far as possible on a regional basis with outposted core staff, and relatively few non-core funded staff are employed in national projects.

41. On a few occasions, CIP has accepted special projects for individual countries in which national competence needed to be built up before the CIP regional approach could be expected to work effectively. At present, staff are posted in Nepal, Tunisia and Rwanda/Burundi and

all are financed through bilateral sources of funds. The Centre believes, however, that its major role in the transfer of technology within a country is one of technical support and that it should not become directly involved in the staffing, funding and programme management of special projects.

42. The implementation of such a policy requires the presence of some agency capable of managing a project in all its aspects, when given assistance from the Centre. Assistance may be given, as needed, in developing proposals and programmes, conducting feasibility studies, identifying and training suitable staff, evaluating progress and in using the technology and materials which the Centre can provide. The national agency may also be receiving bilateral or multilateral support in management, staff or resources. It is expected that this "third dimension" policy, which is essentially one of technical back-stopping, could eventually replace the existing special project concept (in which IARC staff are posted at country level) and, in time, even the regional research team. This policy has been developed to different stages in different countries. In Nepal, Bangladesh and Morocco, bi-lateral projects with expatriate management and CIP technical support; in the Philippines there is a bilateral project with national management, while in Central America, CIP is moving towards the handing over of its regional activities to a six-country association (PRECODEPA)* which will take responsibility for research and training. The Centre will continue to give technical support as needed especially in new areas of research work. Projects based on this philosophy are being developed in Ethiopia and Brazil.

43. There would appear to be some evidence of the success of this approach and it could well form a basis for the delineation of the work of the IARCs and indicate a means of containing the overall size of IARC activities in the long term. It should be emphasized that a main requirement for the implementation of this approach is that there should be an effective research management agency available at country level; where such an agency does not exist or is too weak to be effective, there is a clear implication that the building up of such an agency should be given priority attention.

44. Out of the 90 or more maize-growing countries which participate in the worldwide network of maize trials and the exchange of data, a few have asked for staff assistance and CIMMYT has received extra-core funds to provide the necessary personnel. It is a reflection of the maturity of the Centre and the success over the years in building up national competence in maize research that there are relatively few staff members from CIMMYT assigned to work at national level. Staff so assigned work with the national maize programmes to:

a. conduct research in local experimental stations which would include participation in the international testing programmes;

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* PRECODEPA = Programa Regional de Cooperación en Desarrollo de la Papa.

b. test improved varieties on farmers' fields;

c. multiply seeds of the improved varieties;

d. provide additional training to maize scientists;

e. assist in the formulation of national agricultural research policies which encourage greater food production;

f. test germplasm received from neighbouring countries, Mexico and, in Africa, from IITA and refer results obtained back to the network of scientists involved at various levels in the maize improvement process;

g. assist in formulating improved agronomic practices.

45. In 1979, five countries were involved in such cooperative arrangements with CIMMYT and while in three countries there has been a CIMMYT presence for several years, in two countries the involvement is quite recent.

46. CIMMYT's involvement in the maize programme in Tanzania began in 1973 and two scientists are in post. The project is financed by a bilateral donor and covers crops other than maize with IITA having contracted with the donor and the government to provide technical support and project coordination. IITA is providing research staff to work on grain legumes and ICRISAT has posted a sorghum breeder to work in the project. In maize, despite the production of several outstanding varieties (composites) which have been released by the government, some officials have expressed concern that relatively little attention has been given to the production of hybrid varieties. It should be pointed out, however, that CIMMYT has always been actively engaged in the development of hybrids but does not seek to promote these in a country until adequate seed production and distribution facilities are available.

47. In Ghana and Guatemala, the programmes in which CIMMYT staff have been working since 1979 and 1976 respectively, are characterized by having large on-farm testing programmes. In Ghana, the project is assembling maize composites from Mexican and West African populations and there are on-farm trials at about (100) locations. Similarly, in Guatemala where the breeders aim to release both composite and hybrid varieties, on-farm testing is done on a large number of sites (565 in 1978). A vigorous seed industry has been established and this could become a model for the region.

48. Some 20-25 staff recruited by IRRI are engaged in cooperative projects at national level. Although the distribution of staff between different countries and the nature of the research support will change with time, it is anticipated that there will be a continuing need for about this number of off-campus staff for the near and medium future at least. The Centre feels that this size of off-campus programme represents a reasonable and acceptable management load for headquarters staff. The seven national programmes in which IRRI staff are working have a range of objectives.

49. In Indonesia the main purpose of the three projects, two of which are funded bilaterally while one uses funds from a World Bank loan, is to strengthen national research capabilities with particular reference to rice and to build up a number of research stations. There are ten IRRI scientists in all and there is also an IRRI regional liaison officer for Indonesia and Malaysia posted in Bogor. This large input should perhaps be seen as the later stages of a research development process which began almost 25 years ago with the training of undergraduates through various agencies and it is envisaged that the IRRI presence will gradually diminish over the next five years. This situation should perhaps be contrasted with that which existed in India when IRRI mounted a major effort to assist the Indian Government in the field of rice research. Because there was already an established research structure and an ample supply of graduates who could benefit from further training, the period of the operation was much reduced to little more than five years. Full collaborative work has continued and IRRI continues to make a major input into the All-India Coordinated Rice Improvement Programme and to benefit also from the work done in India. The difference in the time scales of the operations in these countries illustrates quite vividly the urgent need for the development of strong national programmes with which the IARCs may then collaborate on a scientist-to-scientist basis.

50. The main project in Bangladesh has a similar objective, i.e. the building up of the Bangladesh Rice Research Institute.

51. These and other rather varied projects in five other countries fall essentially into two categories: institution building and staff development, and the transfer of IRRI developed technology to the national or farm level. The rationale for the first is obvious and the approach has been successful in other countries; the rationale for the second is less well-defined but in the projects mentioned which, when initiated, could be considered as pilot operations, specific and scarce skills have been introduced to promote the use of established results and materials.

52. Staff members of ICRISAT working in different countries, whether in national or regional programmes are regarded as having three areas of responsibility:

a. Direct contribution to the national programmes;

b. Contributions to the regional programme, mainly through the organization and supervision of regional trials in the country where they are stationed (and consultancy type visits to nearby countries where this is possible);

c. Contributions to the international programme of the Institute by feedback of information and results on the behaviour and performance of different plant materials in different ecological situations.

53. While this is an entirely reasonable position to adopt it can cause difficulties in some instances and in one instance, in which a member of the Institute's staff is contracted to a specifically bilaterally funded national project, differences of opinion appear to have arisen as to whether the staff member should work solely for the national programme or also devote a small proportion of his time to work of wider geographical significance.

54. ICRISAT scientists are posted in Senegal, Mali, Upper Volta, Niger, Nigeria, Tanzania and the Sudan, and although they are regarded as being component parts of a regional programme for which there is a regional coordinator, they work closely with national scientists and government officials in endeavouring to strengthen national agricultural research programmes. A scientist (special project funding) is posted to work on high elevation cold tolerant sorghum at CIMMYT in Mexico while two scientists are posted to ICARDA to work on chickpeas.

55. In many of the African countries, national research systems and programmes are very weak indeed and the manpower base is extremely limited. Considering the time taken by other IARCs to build up research competence in similar situations, the ICRISAT estimate of 20 years to the stage at which fully collaborative projects may become possible may not be unduly pessimistic. What is abundantly clear is that it will require major efforts to build up national systems in several countries and that careful planning of the special projects will be needed to achieve this (with IARC participation at the planning stage) to make the best use of the scientific support that is available from the IARCs and other sources.

56. The work of IITA is also organized on a programme basis and the core programme activities are not regarded as being confined to any one location, while some parts of it may even be carried out using extra-core funds as components within special projects.

57. The Institute has established its own guidelines to help in making decisions about proposed participation in special projects. In essence, participation in the proposed project should give IITA access to an environmental situation substantially different from those in which it is currently working, the project may be expected to generate scientific and technical information of relevance to IITA's research mandate, and the project will incorporate a training component to prepare national staff to assume overall responsibility for the programme at a reasonably early date. It is recognized, however, that, because of the very weak base of trained manpower in some countries, the fourth criterion which the Institute would like to be able to apply, namely, the existence of a sufficient level of national research competence and activity to allow active cooperation to proceed at an early date, may be unrealistic in the context of some national programmes but should be applied if possible when deciding on participation in regional programmes.

58. In March 1980 there were about 22 staff engaged in work in eight major special projects all funded from non-core sources. In addition, two other off-campus research programmes were being carried

out in Sri Lanka and Upper Volta using core staff. The Nigerian Accelerated Food Production Project (NAFPP) funded bilaterally but using up to eight staff members recruited by IITA is not classified by IITA as a special project but rather as a Nigerian project to which IITA has acted as advisor and consultant.

59. Of the eight cooperative projects, seven are commodity based and do not have an institution building component. It is expected, however, that the projects, through the training provisions, will help to improve the national research capability in the various commodity and cropping-systems fields. The projects are in Sierra Leone (rice), Upper Volta (food legumes), Zaire (manioc), Upper Volta SAFGRAD* (IITA contribution in maize, cowpeas, soyabeans), Cameroon (root crops and farming systems, two separate projects on the latter) and Ghana (farming systems). In each of these projects, the field staff are doing a part of the crop improvement work which is an integral component of the farming systems research programme of IITA.

60. The one project in which there is an institution building component is in Tanzania where IITA has entered into a contract with the government and the donor agency to provide the technical input and to administer the project cooperatively with the Ministry of Agriculture. While IITA has supplied staff for the economics and grain legumes component it has entered into agreements with CIMMYT to do the maize work and with ICRISAT to provide staff to work on sorghum. The project was designed strictly as support for the development of a research system, including station development, on crops in Tanzania and although the Centres involved consider that the research results which are being obtained will be of use in other parts of the region and do not wish their efforts to be confined rigidly to the needs of the country, the national staff take a rather different view. The participation of the Centres is regarded essentially as the technical assistance component of the project and it is recognized that the Centres are best able to supply the expertise which is needed. It is felt, however, that the programme content should be determined at national level and within that programme the Centres should contribute their technical expertise. It would seem that there was some lack of precision in the definition of the roles of the Centres when the project was started and that some of the criteria now set by IITA for its participation in national projects were not met. Despite the difficulties which have been encountered, both the donor agency and the government wish to see an increased IARC presence in the second phase of the project which is now being planned.

3.2.2 Effectiveness

61. The combination of differences in philosophy among Centres and the widely varying research capabilities in developing countries give rise to a large number of possible situations which require a wide range of and considerable flexibility in cooperative programmes.

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* SAFGRAD = Semi-Arid Food Grain Research and Development Project.

62. It is very difficult, therefore, to assess the appropriateness of a particular cooperative programme without detailed study but the general comment may be made that the programmes currently being carried out cover a wide range of situations in many different countries and, with one or two possible exceptions, do not involve the Centres in activities which are not clearly within their respective mandates.

63. One objective of all the Centres is to assist in the development of national research capability in the subjects within their respective mandates to the point at which IARC staff may be withdrawn and the work may continue on a collaborative basis. The success of the mature Centres in arriving at the point where they are involved in very few national programmes on a cooperative basis but in many in a collaborative role appears to be good evidence that the past cooperative programmes at national level have been both appropriate and effective.

64. The work of the IARCs, either directly or in conjunction with national research programmes, has provided improved plant materials and technical knowledge which have been used in several countries as the basis for programmes which have produced large increases in production of some of the main food crops. The widespread use of improved varieties of rice in South and Southeast Asia and tropical America and of the dwarf varieties of wheat in India and Pakistan are well known examples. Less spectacular but nevertheless important advances have been made in maize production and the basis exists for improved production of cassava and some other crops. Since the Centres involved have worked for many years in cooperation with the national programmes, the system of working has evidently produced very good results. More precise quantitative evaluation of individual national cooperative programmes has not been attempted.

3.2.3 Discussion: problems and criteria for future development

65. The number of requests for IARC participation in national programmes is increasing steadily especially in Africa and, while this is a measure of the increasing realization of the competence of the Centres, it raises problems for the Centres in making choices between possible alternatives. The main question would seem to be how participation in a particular national project relates to the future development of the Centre as a whole.

66. Within the context of long-range plans of the Centres, more attention should be paid to the type of support projects which would be needed at national level in the countries to be covered by the Centre programme. These projects may range from specialized training of personnel from national programmes which are already well developed, to the building of components of a national research system or even of the establishment of a national research system where it does not exist or is very weak or poorly organized. Such a projection of what would be required of the Centres in this connection would permit the orderly use of special projects to provide such support and could be used to define more precisely the role of the IARCs in them. This kind of planning is not easy, however, since the initiative for involvement in national projects rests with the individual country, but it would allow the Centres to plan their own developments, especially of staff and training, on a systematic basis, to meet the forecasted requirements.

67. It is appreciated that there are many difficulties, not least that the donor agencies and the national governments would need to be involved at an early stage in formulating the policies which permit effective planning. Cooperative planning for national activities in a regional framework is being attempted under SAFGRAD and what is being proposed here as a possible basis for the development of the national cooperative programmes of the Centres does not differ in principle from what is being attempted under SAFGRAD.

68. The report of the Review Committee of the CGIAR in 1977 indicates that the organization and management of national research systems is outside the mandate of the Centres, but that they should be involved in strengthening specific parts of such systems. This position was supported by national scientists in some countries visited. With a long-term projection of requirements at national level, the division of responsibilities between the agencies involved in developing national agricultural systems and the IARCs could be done on a logical basis and the resources of the Centres could be used to maximum advantage.

69. In the absence of an accepted long-term plan, the Centres are compelled to make decisions concerning their participation in a given cooperative programme for which funding is available in isolation from their possible involvement in projects which may arise in the future. In the past, it has been possible, even if difficult, to recruit staff reasonably quickly to fill posts in special projects but recruitment, especially of experienced scientists, is becoming more difficult at a time when demand is increasing. Uncertainties in the level of funds available from year to year make staff development planning rather difficult.

70. Planned development of a Centre's involvement in cooperative projects would seem to be just as important as planned development of the Centres themselves. While any such plans could be vitiated by changes in priorities made by national governments, the very existence of such plans could assist national governments in decision making and so prove useful in two ways.

71. Within a national cooperative project the respective roles of all the parties concerned, national, management, technical support and donor agencies should be clearly defined in the operating document. Differences in perception of respective roles has sometimes caused genuine and sincere differences of opinion on programme content and execution. Such problems are best avoided by a clear definition of roles, responsibilities and lines of command at the start of the project.

3.3 The Regional Programmes

3.3.1 Range of functions and activities

72. Many Centres have established regional programmes by outposting one staff member or a team to strategic locations to serve the regions in which one or more commodities included in their mandate are important. A region, in general includes a number of countries, usually geographically contiguous, which possess similar physical and/or socio-economic environments, face similar production problems and where national programmes are

interested in carrying out inter-country cooperation and exchange of scientific information as well as germplasm. Often the logistical support for regional staff is obtained from sister international institutes or collaborating national organizations.

73. Most frequently the Centres have first developed their on-campus core programmes and have established, or are proposing to develop, regional programmes at later stages in the development of the Centres. Initially, several of these regional programmes were started as special projects and were subsequently incorporated into the core programmes and budget of the Centres. CIP has differed from the other Centres by organizing its regional programmes as core-funded operations concurrently with the development of its on-campus research programme.

74. Several different types of regional programmes may be distinguished. In general, it is not possible for a Centre to carry out all the parts of its agreed research programme at any one location whether this is on the campus or not. Certain studies which involve mainly laboratory, glasshouse and other facilities may be excluded from this general observation. Thus in setting up the core research programme of the Centre the locations at which the work is to be done must also be defined. This having been done, the degree of involvement of the staff of the Centres in the off-campus parts of the research programme varies considerably depending largely on the research capabilities and physical facilities which exist in a particular location or area and on the particular characteristics of the crop, farm system or other topic under investigation. The function described above is one of regional research within the core programme and as such qualifies for core funding. Regional programmes under this heading are discussed in Section 3.4 under 'Core programmes outside the host country'; they have been established for the improvement of individual crops, economic studies and farm systems research.

75. The second main type of regional programme may be classified as a technical liaison or research services type of function. This type of programme usually involves a number of countries in each of which the institutional research base and research competence in the particular components in which the Centres are interested can be used. In these situations outposting of (usually) very few staff to a regional base facilitates more frequent visits to each of the individual countries in the region. These regular, but not necessarily frequent, visits provide a better and continually up-dated understanding of the production problems existing in these countries, of the social and political environment in their agricultural sectors and of the technical and training requirements in those subjects within the Centres fields of responsibility. The regional approach of this kind also facilitates communications among national scientists within and across regions, it makes it easier for Centres to select and provide nurseries of appropriate composition and to monitor their performance and the presence of regional liaison scientists also helps the Centres to respond to requests for assistance and consultations on a wide range of topics.

76. For the Centres working on vegetatively propagated crops regional programmes are essential to facilitate multiplication and distribution of plant materials under strict phyto-sanitary conditions

and to meet national quarantine regulations. This type of regional programme also contains elements of research especially in monitoring of assessment of performance of new materials and systems and it is not always easy or necessary to try to arrive at a precise assessment of the proportion of time devoted to technical liaison and research in a specific instance. An example may clarify the position and also point to an indirect but important role of regionally posted staff in the attraction of bilateral and other funds by national programmes within the region. CIMMYT has a programme of this dual type on wheat in a regional programme based in Kenya. One part of this is clearly research (winter nurseries and selection for disease resistance, the results from which, though valuable to Kenya, are of general value to the research programme); in the other part the officer concerned functions as a liaison officer to national programmes in more than 15 countries. Most of these countries have been able to secure support in resources and sometimes of staff from bilateral and other donors, thus in a sense multiplying the benefits derived from the work of one scientist posted at regional level.

77. The technical liaison activities cover a very wide range reflecting difference among Centres and also among programmes. They may:

a. serve as "relay" between the headquarters of the IARCs and the countries in the region for the international breeding and testing programmes;

b. promote cooperative research programmes on important problems in the region, usually through the existing national programmes;

c. carry out or promote training activities;

d. provide advisory services to individual national programmes;

e. promote communication among national scientists through monitoring tours, field trips, conferences and workshops;

f. develop in some instances regional pest and disease surveillance and early warning systems;

g. coordinate visits of headquarters or other scientists to the region for consultation and assistance;

h. present the needs of the region at research planning meetings held at headquarters;

i. help countries to develop their own proposals for bilateral funding or special projects;

j. develop research methodologies in production agronomy and encourage their implementation.

3.3.2 Funding

78. Although the regional activities have been placed in the broad classifications of research and technical liaison and programmes in the

former category are described in Section 3.4, concepts concerning the funding of regional projects as a whole are treated in this Section. The regional research programmes, as defined in para 74, are activities designed to contribute towards the Centres' objectives in research and training and, as such, clearly qualify for core funding.

79. As already indicated, the experience of some Centres such as CIMMYT has demonstrated that the value of regional programmes, both to the Centre and to the individual countries, depends on the level of development of the cooperating national institutions in the region. Often, regional programmes have been launched after several special projects at national level had already significantly contributed to the development of national research capacities in a few countries of the region and when cooperation links have been established between them and the Centre. The regional programme then can be seen as having a maintenance or support service function for these national programmes. Once this stage of development has been reached, it would appear reasonable that the liaison staff (few in number) should also be funded from core resources.

80. This sequence of development is already accepted as a main objective of regional programme and it becomes important (para 70) for the Centres to try to plan their participation in special projects to ensure that the national programmes which will be called upon to take part in the regional phase will be well developed, thus minimizing the number of IARC staff who will be needed in the regional programme and ensure a balance in their programmes as a whole. This should also assist the Centres to forecast their likely growth patterns over the medium term future and possibly lead to some definition of their ultimate size.

81. The objectives of the economics and cropping-systems regional programmes are inter alia to assist in bringing together researchers, farmers, extension agents and administrators in the process of identification of the production constraints at the farm level, the recognition of institutional and other non-technological inputs needed for high and stable production, the speeding-up of technology transfer, and the maximization of farmer income and land productivity. These programmes may be considered to have research and training functions on the one hand and a liaison function with national institutions on the other. Once the research methodologies have been established, the residual liaison function would appear to qualify without question for core funding. During the development phase, however, although the research component could be paid for appropriately from core funds, on occasions and in the early stages of new research programmes, recourse could be had to special project funding for a fixed period to determine whether or not a particular research topic gave promise of useful results. It would follow, if there were reasonable expectations, that some such projects would likely be proposed subsequently for core funding, this should be taken into account at the planning stage as indicated in para 80.

82. The staffing of specially funded projects, in general, presents problems for Centre management. One way to reduce the size of the problem, would be for the Centres to continue to emphasize to countries

in a region that the national programmes themselves should take active roles to the limit of their respective resources and to assist countries in mobilizing assistance from other sources to build up their national instituti.

3.3.3 Number and size of regional programmes

83. Among the different criteria used by Centres to determine the type, location, number and size of regional programmes, whether research or technical liaison, the following seem appropriate:

a. The expressed interest of regional and national agricultural leaders for the development of the specific crops and the stationing of the Centres staff in the region.

b. The capacity of national research programmes in the region to cooperate effectively with the regional programmes.

c. The potential for expansion of production of the particular crop in the region.

d. The importance of the crop in the diets of the people in the region, especially those with limited resources.

e. The importance of the crop as component of the farming systems in the region.

f. The comparative advantage for the Centre involvement over that of other organizations.

g. Similarities of production conditions and constraints facing farmers in different parts of the region.

h. Interest of national programmes within the region in inter-country cooperation and exchange of scientific information as well as improved germplasm.

i. The core programme research of the Centre has already developed possibilities for the solution of the regional problems.

84. The number of regional programmes that an IARC can be expected to manage depends on the research strategy (e.g. breeding procedures) established by the Centre, the crops involved, the distances of the regions from the Centres location, the number of experienced staff that can be recruited and posted in the region and the strength of the national programmes. The amount of headquarter staff time used in managing these programmes can be substantial. An illustrative list of regional programmes is given in the Table.

85. The size and composition of a regional team clearly depends on the type of activities to be carried out, the number and size of the countries involved, the stage of development and the strength of the national programmes. The reasons for this have been discussed in paras 79-81 and are developed further in Section 3.4.

Illustrative List of Regional Programmes[1/]

Centre	Crop or Activity	Region
IITA	Cowpea	West Africa
	Cassava	West Africa
	Maize [2/]	East & Central Africa & W. Africa
	Rice	East Africa
	Rice based cropping systems	West Africa
	Maize based cropping systems	East & Central Africa
CIMMYT	Maize	Central America/Caribbean; Asia; Andes [3/]; N. Africa/ Middle East. [4/]
	Wheat	Mediterranean/Mid. East; East Africa; Andes; North & W. Africa; Asia.
	Economics	Andes; East Africa; Central America; Asia; Mid. East
CIAT	Beans	Central America/Caribbean; East Africa
	Cassava	Asia; South Cone of Latin America; Central America/ Caribbean; Andes
	Tropical pastures	South Cone of Latin America; Humid tropics of Lat. America
	Rice	Central America/Caribbean
CIP	Potato	South America; Mexico/Central America/Caribbean; Tropical Africa; Mid. East/North Africa; S.W. Asia; S. Asia; S.E. Asia

1/ Existing or planned for 1981-82.

2/ In cooperation with CIMMYT.

3/ In cooperation with CIAT.

4/ Note East and West Africa cooperative programmes with IITA.

86. In general, national administrators give preference to national programmes rather than to regional programmes because the former offer the opportunity for a more focussed attention and deeper involvement of the IARCs in their own national programmes. However, the national scientists would often prefer to participate in the collaborative regional programmes which offer better opportunities for achieving multiple objectives such as promoting scientific interchange, strengthening country capabilities to work on important problems, ensuring a wider coverage of such problems and still providing answers to problems which are of importance to individual countries. The visits of Director level staff to national and regional programmes has helped to overcome difficulties in the past but, because of their other commitments, there are severe restrictions on how much an individual Director can do. As the national programmes become stronger and become integral parts of networks cooperating on an equal basis with the Centres, some of these problems may be expected to disappear.

3.4 Core Research Programmes Outside the Host Country

87. The term "Core Research Programme Outside the Host Country" refers to research that is truly a part of the principal mandate of the Centres, and to which Centre personnel are assigned but which, because of special environmental conditions, cannot be conducted either at the main Centre or elsewhere in the host country. Usually these core programmes have a regional impact even though the research activity itself may be centred in one country.

88. A good example of such core research is IRRI's deep-water rice programme in Thailand. The Philippines does not have many deep-water rice areas, while Thailand has hundreds of thousands of hectares covered with deep-water during or immediately following the height of the monsoon season. Furthermore, Thailand has an experiment station not far from Bangkok which is devoted exclusively to studies of deep-water rice. Therefore, IRRI worked out an agreement with Thailand to post a rice breeder there, supported by core funds. He is supported by one senior Thai rice breeder and several junior assistants. Because deep-water and floating rice are grown extensively in Bangladesh, India and parts of Viet-Nam, a research network has been formed. Annual meetings of research workers are held and there is a regular exchange of germplasm. This same group of rice scientists is also developing rice varieties that yield well under continuous medium-depth flooding (15-50 cm). This is a serious problem in much of South and Southeast Asia because many of the semi-dwarf modern varieties cannot tolerate such water depths.

89. The project on medium depth and deep-water rice in Thailand is making good progress as far as varietal improvement is concerned. There appears to be a need, however, for more intensive work in the management of deep-water rice and IRRI and the national programmes are aware of this.

90. ICRISAT has a major cooperative research programme on sorghum and millet in West Africa. Presently, the posts in this programme are mainly extra-core funded under a UNDP Global Project. The environmental conditions and the genetic constitution of the sorghum and pearl millet populations being grown in West Africa are significantly different and

quite distinct from those in the semi-arid tropics of India. This work is focussed on the two cereal grains for which ICRISAT has a mandate, and may be considered as a core research programme conducted outside the host country. It is proposed that the number of core positions, currently numbering four, should be increased to enable a fully fledged research team to be set up at the Kamboiensé station of the Government of Upper Volta for the main sorghum growing area (precipitation $>$ 800 mm) and to develop an ICRISAT Sahelian Centre near Niamey in Niger. This Centre will be concerned primarily with pearl millet and the farming systems applicable to the drier ($<$ 600 mm) sandy soil areas. This Centre will be the only independent ICRISAT unit in West Africa with all other scientists continuing to work on existing national research stations. Eventually (by 1983), there will be a total of seven core funded positions at Kamboiensé and eight core positions in Niger, with the possibility of a further two should a groundnut research team be included in the West African programme. Other positions in West Africa (17 eventually planned) will remain on special project funding.

91. Questions have been raised regarding the number of ICRISAT staff outposted in W. Africa. (Presently 4 core and 15 special projects - planned 15 core and 17 special project staff in national cooperative programmes). ICRISAT contends that the climate, the spectrum of disease and pest organisms, the edaphic conditions, special socio-economic and farming systems and present levels of research competence of the Sahelian area demand this. ICRISAT plans, in effect, to work with two core funded research teams in West Africa and to integrate the work of the plant breeders into viable farming systems for the sorghum and millet zones.

92. It is difficult to assess ICRISAT's West African Cooperative Programme at this stage of development. Without question the disease and insect spectrum is widely different in Africa as compared with India and African varieties of sorghum and millet contain genetic resistance to pests and diseases which the Indian varieties do not. However, African varieties of sorghum are tall and late maturing. They need somewhat shorter varieties that are photoperiod insensitive, which will allow them to mature earlier and escape drought. According to ICRISAT scientists, a group of superior varieties of both sorghum and millet are being developed that combine the best elements of the Asian and African varieties. There has already been a significant flow of resistant genetic material from West Africa back to the core breeding programmes at ICRISAT Centre, Hyderabad. This is particularly so with regard to resistance to pearl millet downy mildew, which decimated the Indian pearl millet crop in the early and mid- 1970s. Lines incorporating this resistance are already reaching the testing stage in India.

93. The great distance between India and Africa tends to justify a major and semi-autonomous operation in Africa. ICRISAT intends to include groundnut research in its programme in view of the importance of this crop in small farmer agriculture in West Africa. A limited farming systems programme is underway and agricultural economics studies have been initiated and will be expanded.

94. A third example of a core research programme outside the host country is CIAT's work with tropical pasture improvement in Brazil. The Centre has posted three core-funded scientists at the Centro Nacional de Pesquisas Agropecuarias do Cerrado in Brasilia to conduct work complementary to that being carried out in Colombia at Carimagua. This is done so as to work intensively within the special soil and climatic conditions that exist in the vast Campo Cerrado of Brazil. Another distinct advantage of this programme is that Brazil furnishes eight scientists to work with the three CIAT scientists. Brazil also provides most of the operating costs and research facilities.

95. CIMMYT also undertakes several core research programmes through its regional staff. Examples of these are numerous. One is the work on soft-endosperm maize for the Andean Region of South America. This effort is based in Ecuador and draws on the support of the regional programmes. A second effort in maize concentrates on downy mildew resistance for maize producers in South East Asia, especially in Thailand, Philippines and Indonesia. This research is headquartered in Thailand. A third thrust, again in maize, is based with IITA and supported by efforts in eastern Africa, especially Tanzania. This work focusses on developing varieties resistant to streak virus for Sub-Saharan African farmers. The wheat programme is also involved in off-campus research in which problem focussed research must be undertaken off-campus. One such effort relates to stem and stripe resistance for wheats and is centred in East Africa. This activity also allows breeders in ICARDA and in the Middle East national programmes to test their materials under appropriate stress during their off-season, thereby saving time in the development of improved varieties. A similar effort is underway in the Andean region, headquartered in Ecuador. Here the concentration is on stripe rust for wheats and on barley yellow dwarf for barley. Both the maize and wheat programmes regard their regional programmes, and indeed their efforts centred on national programmes as contributing directly to the core-mandated, on-campus research programme.

96. The Economics regional programmes carried out by CIMMYT works with national programmes to develop procedures to improve the evolution of more effective agricultural technologies. These procedures feature collaboration between biological scientists and economists. With national programmes directly responsible for forging maize and wheat technologies, the Economics Programme must work with them to develop procedures which will make research on technologies more cost effective. To ensure the general applicability of the procedures and to reduce costs, a regional approach was adopted. The research experience in the national and regional sphere, along with that of headquarters staff who collaborate with selected national programmes, has been integrated in a manual which presents efficient guides for describing farmer circumstances and for using this information to orient biological research on technologies. This work is supported by CIMMYT biological scientists, especially those in the training programme.

97. There is little question about the work being undertaken by CIMMYT's regional programmes in crop improvement. The justification in economics and agronomy is less clear. To the extent that the programmes concentrate on the development of cost-effective procedures for use by national programmes (as a research activity) or on training or stimulating the implementation of these procedures (as a support activity) the efforts are consistent with core funding. It is clear, however, that the formulation of technologies, the monitoring of the speed of technology transfer, and the maximization of farmer incomes and land productivity are national level activities and could perhaps be funded more appropriately as special projects. A precise separation of these two categories is relatively unimportant so long as the programme of work is carried out effectively and efficiently.

98. IITA - which has no regional programmes at present - is proposing the following activities to be carried out by its regional programmes in a cropping system programme:

a. identification of the farm level production constraints - technological and socio-economic - and to provide feedback on priorities to the IITA headquarters;

b. identification of means of maximizing the human labour output and a better utilization of the physical environment to maximize farmers income and land productivity;

c. recognize the institutional and other non-technological inputs needed to promote high and stable production;

d. help organize training of national programme staff and the identification of appropriate consultants to support a speedy transfer of technology and the benefits thereof.

99. The organization of WARDA, a sub-regional unit, is such that most of its activities, which are themselves wider in scope than those of other IARCs, can be classified as off-campus core research. Within the countries of the WARDA region, national research facilities and capabilities are mostly very weak and components of the regional research programme are generally located within the strongest appropriate national programme. So that although such national programmes may be supported by funds from different sources, the results are of wider applicability. The network concept of cooperating national institutions is developing and producing results even though most countries are weak in resources. This suggests that the typical model described in para 73 for the development of regional programmes may not always be appropriate.

100. Multi-locational breeding programmes are essentially core research activities and usually involve cooperation and collaboration among scientists at the Centres and the plant breeders in the national programmes. In the case of well-developed national experiment stations, the programme is carried out by the local plant breeders in collaboration with the IARC involved. In cases where the national programme is still in an early stage of development the Centre may post a plant breeder there until local scientists have been trained to assume the duties.

ICRISAT's West African programme is a good example of this situation. Multi-locational breeding programmes are a logical outgrowth of the international testing programmes.

101. The rapid growth in the number of regional research projects, both actual and proposed, gives cause for concern on two accounts. First, the total cost may become large in relation to the cost of on-campus work and, secondly, there appears to be a distinct possibility of overlap between programmes of the different Centres when working in the same geographical area especially in the fields of farm systems research and in economics. Some rationalization of efforts between Centres seems to be essential to prevent undue proliferation of such programmes and the Centres should explore possible ways by which this might be done.

3.5 Collaborative Research Projects*

3.5.1 Developing countries

102. The IARCs are engaged in collaborative research projects with national programmes in developing countries with the aim of finding solutions to problems of general interest to the IARCs but which are of special importance to the individual country. As a rule the national programmes involved have the institutional capability required to study the problems in agro-ecological and/or social conditions different from those at the IARC headquarters. These research arrangements require a close working relationship between the IARCs and collaborating national scientists and the Centres do not outpost staff to these programmes on a continuous basis but may assign headquarters staff to give overall supervision to them.

103. Most of the IARCs are engaged in this type of joint projects and the range of activities is very wide. Examples are: the development of varieties with greater resistance to important pests and diseases, screening of varieties for tolerance to adverse soil conditions or to drought, studies of the efficiency of water management systems under special conditions and identifying constraints to the successful operation of regional programmes. In certain instances the differences in geographic location allows two generations of certain crops to be grown in one year, one by the national institution and one by the IARC, an arrangement which helps to speed up the breeding programme and is also of direct value to the country concerned.

104. The projects are generally funded as special projects or the country and the IARC cover their own expenses, the IARC part being met occasionally from core funds.

105. The collaborative projects contribute to the efficiency of the CGIAR system by mobilizing appropriate national research capabilities to assist the Centres in furthering their mandates at minimal cost. Further-

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* Such projects may be core or special project funded.

more, they improve communications between national and IARC staff, give recognition to the national programmes which they help indirectly to strengthen and contribute to national self-reliance while promoting international cooperation.

106. It seems appropriate to carry out these collaborative projects even where small amounts of money are needed from the IARCs to enable full use to be made of the national research programme capability in the joint programme. This is important since many donor agencies do not respond readily to requests for small sums of money.

3.5.2 Developed countries

107. This important area of collaborative research is not strictly an off-campus activity of the IARCs; rather it is work done at particular specialized institutions to help to resolve some of the problems identified in the field by IARC staff or to provide basic scientific information of potential value to the IARC programmes. The criteria used by the Centres for involvement in these joint projects are varied but ideally the initiative should come from the Centre after joint technical discussions between themselves and possible cooperating institutions. It should be recognized, however, that donors often wish or are constrained by regulations to promote projects in institutions in their own countries or their specialized institutions are themselves seeking funds from potential donors. The Centres are aware of the dangers of becoming involved in long-term or speculative projects of this kind since the cost to them can be considerable especially in core staff time, publications and maybe in core research as well in the long run. The view of the Centres seemed to be that donors respond in reasonable and flexible ways when problems arise and that the arrangements are highly beneficial to the Centres since the Centres gain access to a pool of scientific knowledge and experience of a kind different from the collective knowledge of the Centres themselves and at a relatively low cost.

108. There is a large diversity of these activities going on between the different Centres and specialized institutions. Most of these investigations are in the field of biochemistry, cytology, genetics, plant physiology, microbiology and virology, and are carried out in University and other institutions mainly in North America, Western Europe, Japan and Australia.

109. The type of funding used by the Centres for their components of these joint projects is variable, some projects are core-funded while others are supported by special project funds given either to the IARC or to the executing agency; the commonest arrangement being a co-operative arrangement between the IARC and a university or a research institution in a developed country, by which research of mutual interest is done usually at little direct cost to the Centre but sometimes at an appreciable indirect cost in terms of travel and core staff time.

110. Considering that many offers of cooperation are available at little direct cost to the Centres and that the range of possible co-operating institutions is very wide, it seems likely that only on very rare occasions can the use of core funds be justified for such projects.

111. Several IARCs, in particular those which have long established research programmes, have recently decided to carry out more basic research on their headquarters in particular in the fields of plant physiology, cytology and virology. They argue that, at a certain stage of development of their research, it is more effective to carry out these activities at the Centres rather than to depend on advanced institutions which are distant from them and are, therefore, unable to interact closely with staff of other disciplines in the Centres' programmes. Furthermore, most of the advanced research institutions are not in tropical or sub-tropical environments and do not have easy access to the considerable amount of germplasm, other material and information available at the IARCs. With some crops these problems can be overcome but in others there are serious obstacles to the movement of plant materials across national boundaries.

112. Many of these investigations require expensive and specialized equipment and staff experienced in the use and maintenance of such equipment. Only when the problem to be investigated dictates that the work should be done at a Centre can the total expenditure on equipment and the necessary supporting services be justified. Even then and assuming that funds can be obtained, care needs to be taken that the balance of work and expenditure at the Centre is not seriously disturbed by such a development.

3.6 Collection of Information and Data

113. For the purpose of this analysis one may distinguish three different main objectives which lead the Centres to launch off-campus activities for the collection of data and information. These are:

(i) base line data and information collection on their target areas;

(ii) current awareness and monitoring of agricultural developments and problems which are relevant to their mandate;

(iii) impact assessment of the technologies by the Centre.

3.6.1 Base line data and information

114. During its establishment phase or whenever a new research problem is addressed, an IARC needs to collect and assemble existing information and documentation. Most of this work can be carried out from the main headquarters but, in some instances, it involves visits from the Centre personnel to existing libraries and other sources of information. An example of this type of activity was the establishment of the documentation service of ILCA on livestock research in Africa, its microfiching and the supply of copies to the cooperating documentation centres.

115. The basic information required is not always readily available from existing documents or sometimes is not available at all and has to be collected by means of surveys. Several IARCs have, therefore, launched

programmes to fill these gaps. The importance of these base line surveys has been stressed by the stripe analysis of farming systems research which gives some guidelines as to the respective involvement of national programmes and IARCs in this type of activity. An example is the survey of the infertile acid soils areas of South America by CIAT which involved several field missions in the region. Similarly the ETES livestock survey being conducted by CIAT in Brazil, Venezuela and Colombia, with the help of the Technical University of Berlin, is financed as a special project by GTZ. Another example is given by the state of knowledge reports by ILCA on livestock production and related natural resources in the humid and sub-humid regions. Staff were outposted in Nigeria for this purpose and travelled extensively in West Africa. A symposium was then convened to assemble further information and give guidance to the future research programme.

116. The demarcation between research and surveys is more difficult to make for the village and farm studies which are carried out by several Centres. A distinction should first be made between those studies which aim at identifying problems and priorities for research programmes of the Centre, and those which are carried out downstream from the research programmes- that is for the assessment of their impact on production. The first type will be discussed here, whereas the other is considered below under Section 3.6.3 "Assessment of performance". Examples of the first type are the farm surveys and village studies carried out in the Aleppo province by ICARDA, in several regions of Colombia by CIAT, India by ICRISAT, Philippines by IRRI, etc. Other examples are the surveys carried out or promoted by outposted IARCs personnel (i.e. outside their host country), for example those of CIP in Latin America. For CIMMYT, these surveys are part of their national project activities and research on procedures and methodologies with a limited feedback to the headquarters but mostly for the use of the national programmes. Several studies made by IFPRI in India, Brazil and other countries also fall in this category.

3.6.2 Monitoring

117. Both CIMMYT and ILCA have clearly identified programmes with staff outposted solely for this purpose. In the case of CIMMYT, it is the surveillance of disease incidence and outbreaks in the Near East/ Middle East and Asia through a special project. As regards ILCA, monitoring of selected livestock development schemes is considered as an integral part of its core research programmes and involves staff in Kenya, Botswana and on-campus in Ethiopia.

118. Many other IARCs monitor production, pest and disease outbreaks and other factors as regards their mandate crops. Field staff in national projects or regional programmes make regular reports to their headquarters in this respect. Headquarters staff also collect information during their field visits on the harvests in different countries and the factors and problems which affect them. The methodologies of monitoring and reporting have not been elaborated systematically as have those of ILCA and CIMMYT. Another example is that of IFPRI whose mandate is *inter alia* to undertake research on the impact of changes in national and international policies in food production and consumption.

119. With the exception perhaps of the monitoring programmes of ILCA and CIMMYT, staff of the IARCs are not engaged directly in making observations and collecting data in the field, but rather in assembling, compiling and analyzing data which are generated by others, such as the national census programme, the FAO and USDA statistics, and so on.

3.6.3 Assessment of performance

120. Whereas the IARCs have a limited direct involvement in national programmes for the adoption of new technologies by the farmer, it is of particular interest to their research programmes to understand why some technologies are readily adopted and others are not. The largest part of the economics programmes of the IARCs is devoted to surveys of the factors which influence the adoption of new technologies by the farmer in general and by different categories of farmers in different natural and socio-economic environments, in particular. Examples of these are the six-country cooperative network programme of IRRI for the study of constraints on increasing yields and the surveys of the adoption of HYVs as part of several national projects of CIMMYT.

121. Whereas these surveys are mostly concerned with micro-level economics the IARCs are also involved in studies of policies and macro-level factors influencing the adoption and performance of new technologies. These studies should not normally call for off-campus activities and are mostly based on published statistics and other documents. These are carried out mostly by headquarters staff as, for example, the ICRISAT studies of effects of technology, marketing and price policies on agriculture productivity in India. There are few important exceptions to these, however. One is the economic analysis on commodity production in a region by outposted economists of the CIP regional programmes. Another is that of IFPRI, IFDC and IRRI in a cooperative project on rice policies in Asia. Several projects of IFPRI in N.E. Brazil, Bangladesh, Colombia, India and Sri Lanka also fall in this category.

3.6.4 Discussion

122. Criticism has often been voiced in the past that IARCs did not pay sufficient attention to the previous research work which had been carried out by others, that their expatriate staff sometimes did not have a sufficient experience of the local conditions of agriculture, of its natural and socio-economic environments and, as a result, their research priorities and direction of work did not correspond to the priority needs of the national programmes. During the last five years, there has been a considerable development of off-campus activities for surveys and collection of other data by the IARCs to remedy this situation. The main question now is to determine the optimum size of these activities as part of the core programme of the Centres. Some IARCs are reluctant to involve their research staff unduly in basic surveys and consider that their mandate is to work mostly for the development and adaptation of new technologies. This is particularly true for those crop improvement programmes which aim at producing widely adaptable material. The degree

of involvement of IARCs in this field varies considerably depending on their mandate and other circumstances. For the Centres which have research programmes on production systems, on the contrary, the basic knowledge of the soil, climate and land use patterns and that of the existing farming systems is essential.

123. Several national and international institutions carry out this type of survey as part of their own programmes and the IARCs can benefit from these by making appropriate cooperative arrangements. An example of this is the cooperation of IARCs with the FAO programme on the characterization and definition of distinct agro-ecological zones for crop production and land use purposes.

124. Some of the issues identified for base line surveys (i.e. their optimum size as related to that of the research programme) also apply to monitoring and surveillance activities. It can be argued in a simplistic manner that IARCs were not established to watch what is going on but rather to find ways of changing and improving the present situation of food production of developing countries. Several quinquennial reviews, however, have demonstrated the difficulty for an international centre (which by essence is expected to serve many countries) to select its priorities and to ensure that its research programmes are relevant and useful to the largest majority of these countries and their people. This cannot be achieved without a continuous monitoring of the conditions in developing countries.

125. Is the flow of information from the countries to the IARCs sufficient? Should it be increased or decreased or obtained in another way? For example, it may not be necessary that each Centre have teams monitoring the production of its mandate commodities in each developing country. Perhaps, IARCs may join or harmonize their efforts in some countries so as to avoid the proliferation of different teams surveying and monitoring the production of different crops which are often associated in the same farming systems.

126. Another way of gathering information on priority research problems is to establish regular consultations with the senior staff of national agricultural research programmes not only individually but also collectively. This is to some extent obtained at the technical level by the regular monitoring tours by which the collaborators in a regional testing programme visit collectively all the sites where the material is tested. This approach could be broadened and also be used in determining research priorities in other programmes and in farming systems research in particular. Thus, instead of outposting more staff of the IARCs in different regions to gather information and report back to headquarters, the possibilities of having more senior staff of the national programmes of these regions temporarily outposted on the campus of the IARCs should be further explored as a means of ensuring the relevance of the research programmes of the IARCs. Additionally, the IARCs may make wider use of the regular consultations held by international and regional organizations (FAO, IICA, CATIE, SEARCA, etc.) to gather information on research problems and priorities.

127. The assessment of the performance of national production programmes by an international organization is a somewhat delicate matter as it can lead to implied criticism of national development policies and programmes of the local government. Most IARCs, therefore, tend to work through national institutions in this field. In many countries, however, the agricultural economists are located in institutions or administrative units which are quite separate from the other agricultural research programmes. The IARCs economists will often cooperate with institutions which are different from those which work with their IARCs colleagues in the crop improvement programmes.

128. The role of the economists in the regional programmes requires further clarification. It is not clear how these economists will cooperate with national programmes and the economists at the IARCs headquarters, in particular what will be their roles in micro-level and macro-level studies respectively.

129. The comparative advantage of the IARC economists in assessing the performance of new technology as compared with that of the economists of other institutions, national or international, could be questioned. Independent external assessments may be preferable and could be arranged on a collaborative basis by the Centres without having to establish new positions for this purpose.

130. Another question relates to the necessary fragmentation in economic surveys by IARCs which result from their specialized mandate in specific crops. This can lead to duplication of efforts by several Centres in the same region or to narrowly focussed studies which may fail to consider the relative importance of different commodities in the national economies. Two views were heard; the first, the problem was considered to be more apparent than real and the second that each Centre should collect the data needed and make use of the exercise for training national staff.

131. While all the outposted staff should play a role in gathering survey information on agriculture development and technology performance in their respective areas, this function should not in general be considered as a primary justification for their outposting but only as a supporting role to other tasks which they have to perform. When the Centre feels the need to launch a specific programme to gather data and information, such a programme will in general be of limited geographical scope and duration and therefore should be financed through a special project, unless it is a short-term undertaking to define the regional relevance of a new research proposal. The obstacles which international staff usually face in such undertakings (language in particular but also national sensitivity) should induce the Centre to carry out such surveys through cooperative programmes or consultations with national scientists, the Centre being mostly involved in setting methodologies, assisting in training and interpretation of data.

132. The direct and active involvement of outposted staff in broad scale surveys of the physical and socio-economic environments seems rarely justified and Centres should generally seek cooperative arrangements with national and international organizations competent in these fields.

133. In data and information gathering in regional programmes and national projects, it is recommended that the Centres examine the possibility of closer cooperation amongst themselves so as to avoid several Centres launching surveys on specific crops or cropping systems which may overlap in the same region or country. Furthermore, as the amount of data and information collected by the IARCs increases, it is recommended that they maintain these data and information in a readily available form and continue to develop their cooperation with the international information systems such as Agris and Caris. Much of the information is not, however, in a published form and hence would not find its way into normal information systems. Perhaps a list of titles of what has been done could be made available and copies of survey results made available on request.

3.7 Germplasm Collection, Preservation and Utilization

134. One of the first activities of each of the crop-oriented Centres was to assemble germplasm collections of the crops for which they had primary responsibility. This operation was a prerequisite for a successful plant breeding programme, as well as for an international crop testing programme.

135. Early collection, characterization, description, cataloguing and preservation of the existing varieties of the crops within their mandate in a viable form is an urgent necessity for each of the IARCs engaged in crop improvement programmes. If their plant breeding programmes are successful in producing new varieties with superior yield, uniformity, quality, disease or pest resistance, wide adaptability and dependability of production, such varieties will - while making significant contribution to production - be attractive and profitable to cultivators and will replace the varieties traditionally used. Thus, unless the traditional varieties are preserved, many genetic characters which may be potentially valuable for the future, will be permanently lost.

136. In addition to the traditional varieties of the crops in question, it is important to collect the total worldwide genetic diversity of the crop species, including wild relatives of existing and potential new crop plants and to preserve this genetic resource and keep it available on call for use in developing varieties needed for new and changing situations, or to meet and overcome threats posed by new diseases or insects. This is a recognized responsibility of all the Centres which are directly concerned with genetic improvement of specific crops. The management of the germplasm collection, the information thereon, and the distribution of material and information is largely an on-campus activity. Collection and utilization, however, involve extensive off-campus work.

137. The collections have been obtained in several ways. Quite a few accessions have been gathered by expeditions formed by the Centres themselves, in which one or more of the Centre scientists participated. In several Centres this effort has accounted for about one-fourth of the material collected and is still being pursued.

138. The largest number of accessions has been obtained, however, through introductions from the national scientists and institutions, both in the developed and less-developed countries. The first surge in the number of accessions acquired in a collection has usually come from national institutions that already had accumulated sizeable germplasm banks. India is a specific example here when it provided the bulk of the ICRISAT collection. These collections are often numbered in the thousands. Later, many of the national programmes with their own funds have continued to collect germplasm and have turned over a portion of each sample to the IARC concerned. Equally, IARC sponsored missions have offered samples of anything collected in a country to the national collection.

139. In 1974, IBPGR was formed to assist in the collection and preservation of the world's plant germplasm. It makes grants primarily to institutions in less-developed countries to undertake collecting missions but uses the expertise of IARCs and developed countries where necessary. Examples are the collection of sorghum and millet in Africa by ORSTOM , IRAT and ICRISAT, of old maize races in many Latin American countries, durum wheats in North Africa by the Bari Institute, tropical forages and Phaseolus beans in Latin America in association with CIAT, and rice in association with IRRI, IITA, IRAT and ORSTOM.

140. The IBPGR's cooperation with the IARCs varies depending upon the needs of the world community of plant breeders, the needs of the Centre, and, of course, on the size of the collection already existing at the Centre or at other genebanks.

141. The size of the germplasm collection indicates the progress that has been made in these off-campus activities of the IARCs. For example, IRRI has assembled about 50,000 rice varieties and genetic lines, including 1,900 specimens of Oryza glaberrima. CIAT has over 26,000 accessions of Phaseolus beans (four species), and over 3,000 varieties of cassava. CIMMYT has 13,000 accessions of maize, but only 4,000 of wheat because it relies on other Centres to maintain the world collection (about 26,000 varieties). CIP has a germplasm of potatoes numbering over 13,000, and IITA has over 9,000 cowpea accessions. ICRISAT has 16,000 accessions of sorghum, 8,000 of pearl millet, 7,000 of pigeonpea, 13,000 of chickpea and 8,200 of groundnuts. These crops form part of the IBPGR network but the network will cover many other crops not part of the IARCs' mandate.

142. The literally thousands of genetic lines and varieties that are being sent out by the Centres to countries around the world which have requested breeding or testing materials is evidence of the importance of this work to world agricultural and food production. Furthermore, it is significant simply because valuable germplasm which might otherwise be lost is being preserved.

143. The IBPGR has a few staff members in permanent positions, some of whom are outposted in specific regions. These outposted staff play a role in the field of genetic resource conservation similar to that of the regional programme staff of the IARCs in promoting national

activities and regional cooperation. IBPGR uses its $3 million annual budget primarily to stimulate world action on collection, conservation and documentation of genetic resources and for the training of personnel to work in this field. It contracts with national, regional and international Centres for germplasm collection and conservation and also uses its own staff because it deals with all major crops of the world whereas the IARCs deal with only a limited number. It relies on the IARCs to handle much of the germplasm collection for its crops within their mandates. The IBPGR regards the germplasm work of the IARCs as essential work for the Centre's core funding. However, it has found that in some cases it has had to contribute limited resources to bridge a biennium when the IARC has not yet obtained funds for the purpose. In the case of some Centres, IBPGR support has extended beyond this stimulatory phase. Even when Centres have core funds for collecting, the IBPGR frequently pays in-country costs to national programmes and frequently provides personnel for the field work.

144. The IBPGR's role is primarily that of stimulating, promoting and coordinating efforts in germplasm conservation and management, promoting training of specialists in the field and sponsoring studies which help to establish standards and guidelines for these activities. It does not have the resources for maintenance and management of the collections themselves. Each IARC involved in crop improvement generally assumes a major role as a principal repository for the collection, maintenance and management of the germplasm resources of the crops within its mandate. The IBPGR attempts to see that replicate collections of the same crops are maintained at other locations as well, and to encourage a like programme within the many crop species not addressed by the IARCs.

145. The review endorses this programme as one of great importance to future world agriculture and is of the view that serious efforts should be made to fill any gaps known to exist in genetic resource collection, conservation and management of existing collections. Much of this, especially with crops not addressed by the IARCs, will and should be done outside the CGIAR, but with encouragement from the IBPGR.

146. Each of the IARCs concerned has developed seed storage facilities which meet the requirements for at least some of the storage classes set forth in standards developed and published through IBPGR. IRRI has recently completed a very substantial and high quality storage facility for its rice collection. CIMMYT and ICRISAT are currently making substantial improvements and expansions in their seed storage facilities. ICARDA plans to incorporate such facilities into its physical plant as it is constructed.

147. It should be re-emphasized that samples of all of the materials in these substantial collections are available to scientists in all countries on request but it should be clearly understood that for the Centres to be in a position to do this is a costly operation.

3.8 Training and Follow-up

148. Training is a major function of the IARCs and is organized basically into four categories:

(i) in-service trainees; young researchers and extension personnel from developing countries and with experience of national programmes spend varying periods, usually one crop season, at a Centre;

(ii) graduate students/research scholars; course content varies but is essentially in specialized research training often as part of the fulfilment of the requirements for the award of higher degrees by collaborating Universities;

(iii) post-doctoral/research fellows; these scientists usually spend up to two years working with the Centre scientists in normal programmes. Apart from the experience which the fellows gain, the Centre benefits from the extra staff-time which they provide;

(iv) visiting scientists; may spend from one week to several months at a Centre and work with Centre staff on specific topics (this is often a two-way training in that both parties derive some benefits).

149. Although a major activity of the Centres, most of the training is given at the Centres themselves except for regionally organized short courses, symposia, seminars and workshops (and for the few in-country programmes arranged by CIAT)*. For most Centres it is an off-campus activity only insofar as Centre staff in the field or on visits to national programmes may assist in the selection of trainees and assist in their in-post training both before and after their courses at the Centres.

150. The decisive influence which IARC staff, whether posted at national, regional or Centre level, have on the selection of national scientists for training programmes, workshops and seminars sponsored by the Centres had not always been used with adequate recognition of the local situation and established procedures. This lack of consideration has resulted in strong criticism from some national quarters and has been quoted in national administrative circles as an obstacle to the development of good relations between IARCs and national research programmes. The difficulties appear to have arisen mainly from lack of attention to

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* This trend towards the organization of country level training courses can also be observed with the cereal and food legumes improvement programmes of ICARDA. IBPGR is an exception here. It suggests an international training course and provides fellowships for scientists attending, not at the Centre but in other respects follows IARCs with regionally organized short courses and study tours.

established procedural arrangements rather than from any other cause. Centres, while recognizing the authority inherent in officially established procedures, are encouraged to work towards a more flexible system of recruiting candidates for training, involving close cooperation with National Governments and based on mutual understanding and confidence.

151. The role of the Centres in the training field is most highly regarded amongst staff in national programmes and, even though there is sometimes appreciable wastage of trained staff out of the national programmes, training is an essential function and there seems little likelihood of any reduction in demand for places in the foreseeable future.

152. Two constraints may be recognized; first, the amount of staff time available for group training activities is limited and, at post-graduate level, a scientist should not be called on to supervise the work of more than two or three students. This limitation is unavoidable since most Centre-based scientists spend an appreciable part of their time away from the Centre when visiting programme activities in other countries. Secondly, in some of the countries, where there are few trained staff and the needs for training are great, there are sometimes insufficient candidates with the requisite qualifications to take up all the places that are on offer.

153. The general success of the training programme of the Centres is evident from the enthusiasm of former trainees met when travelling in many developing countries and from the development, in some countries, of effective national programmes in which Centre-trainees have played a considerable part.

154. In those areas where there are strong national research institutions and programmes and particularly where the regional approach to research and training is most strongly developed, national staff are taking an increasing part as teachers in the courses thus reducing the demands on the staff of IARCs. The orientation of these courses is often more towards transfer of technology than to training in research itself. As the involvement of national staff as teachers in off-campus training increases still further, the nature of the courses needed at the IARCs may change towards a greater degree of specialization to try to meet more precisely the needs of individual scientists some of whom will themselves already have had considerable research experience.

155. There have been a few instances where trainees appear to have been assigned to inappropriate courses. Such problems could perhaps have been avoided if there had been closer consultation between the Centres and the national authorities. These occasional problems should be seen in the wider context of the very high regard which most countries have for the training programmes of the IARCs.

156. Both core and non-core funds are used to finance the training programmes at the Centres but the proportion varies from Centre to Centre. At IITA, most of the cost of training is met from core funds, but, since most of the special projects have provisions for training at IITA or elsewhere, the cost of some trainees is borne by these funds.

At CIMMYT, ICRISAT and IRRI on the other hand, most of the cost of the training programmes is met from grants (bilateral and others) made specifically for this purpose or, where special projects are involved, from the training provisions included in those projects.

157. The Centres, both through their training offices and through the individual commodity programmes, have kept in close touch with as many former trainees as possible. For the long established Centres such as CIMMYT and IRRI, these alumni are numbered in thousands and are reported to be amongst the best collaborators in research between the Centres and national programmes. The alumni themselves value their contacts with the Centres rather highly and often seek advice on research strategies and procedures from the Centres and endeavour to meet Centre scientists when the latter visit their countries.

3.9 Consultations and Consultancy Services

158. The IARCs do not provide formal consultancy services to individual governments or to specific programmes. However, since the IARCs have research programmes of various kinds in many countries there is regular contact between the staff of the Centres and those of the national programmes with which they are working. In these countries there is, therefore, regular informal consultation with the national administrative and research staff on all aspects pertaining to the research programmes. This takes place regardless of the particular type of research activity involved and is regarded by the Centres as having two major beneficial consequences. The IARC scientists learn more about the nature of the problems in each country and of the priority which should be afforded to work on them, while the national programme personnel become more familiar with the improved materials and practices which are available from or through the IARCs and of the wider research and testing networks which are being developed both for evaluation of these items and for the feedback of problems as they arise.

159. Often the visits of Centre scientists to a national programme are short but the Centres consider that such visits are an essential part of gaining and understanding of national requirements and of the problems and constraints faced by the scientists in the national programmes.

160. The collective information gathered by the scientists of a Centre during these visits is discussed at programming meetings and helps to keep programme formulation and development in line with identified needs.

161. At the more formal level and usually held on a regional or sub-regional basis, conferences, technical seminars and workshops, sponsored by the Centres, form another important part of the ongoing consultation between Centres and national programmes designed to encourage the transfer of technology and the feedback of results and problems to the Centres. Such meetings are often financed directly by the Centres from core funds (also an element in the training programme) but grants from other organizations are also used when available.

162. Clearly most of the discussions are concerned primarily with research problems and programmes but, since it is not usually possible or desirable to consider research in isolation from other aspects of crop production, it is inevitable that consultations have taken place in the past on other subjects of which seed production programmes and the identification of technological and sociological constraints to production may be mentioned. When a Centre perceives that it has a comparative advantage over other institutions in providing guidance on topics associated with national research programmes, such consultations can take place during the normal course of staff visits to view and discuss national programmes.

163. With rare exceptions, staff of national programmes who were met during the mission's field visits indicated that they welcomed the opportunities to discuss their problems and programmes with scientists from the Centres and said that they derived considerable benefits therefrom.

164. Concern was expressed in some countries, which already have well-developed national programmes, that while there was general consultation between the scientists in these programmes and those at the IARCs, both with regard to the collaborative work in these countries and to the content of the research programmes of the IARCs, it was felt that this could be made more effective with perhaps a move towards a more formal and decisive participation of national scientists in the planning of the research programmes of the Centres. The wide mandate of the Centres and the many countries, which their research programmes are designed to serve, could make the implementation of such a proposal rather difficult on a global basis but could perhaps be more practicable at the regional level where programmes are by definition designed to be of value to a group of contiguous countries having similar ecological conditions and problems. The network workshops held by CIAT accomplish joint planning on a regional basis. It should not be overlooked that the composition of the Boards of the IARCs is such that developing countries are represented at the highest policy making level of the Centres.

165. Although difficult to quantify, there is little doubt that consultation with the personnel of national programmes is considered by each of the Centres to be an important activity and an integral part of their respective programmes.

166. The number of requests for consultation with the Centres and advice from them on the development of national programmes has been increasing steadily and placing quite a large workload on the Centre scientists. While the Centres have a responsibility to assist in the development of national research capabilities it would seem that, in general, such consultations should be related to technical matters on subjects within the mandates of the Centres.

167. In a few instances Centres have contractual obligations with donors to provide certain services to bilateral projects which the donors are financing. During the Workshop it was suggested that this arrangement did not seem to differ in principle from that involved in a

normal consultancy contract and that if such contracts were entered into they could form a source of revenue from which extra posts might be financed. Since under present rules, such revenues are not necessarily available for use for the suggested purposes and that there are dangers in promoting revenue producing activities there was little support for the suggestion.

4. OFF-CAMPUS ACTIVITIES IN RELATION TO OTHER ACTIVITIES

4.1 Balance of On-Campus/Off-Campus Activities

168. The Consultants made an approximate analysis of the proportion of the total budget that is being spent for off-campus activities. For a few Centres it was not possible to obtain accurate figures because, although a portion of their core funds is used for such items as training and international testing, the precise amount was not specified. In addition it is difficult to quantify the contribution of the core staff to the backstopping of these activities. However, in the case of CIP, CIMMYT, ICRISAT and IRRI, it was possible to reach an approximate figure.

169. CIP has made a policy decision to have regional programmes around the world, principally because of the difficulties in moving the vegetatively propagated potato from country to country. Therefore, it spends about one-half of its budget in off-campus activities.

170. CIMMYT, IRRI and ICRISAT are spending approximately 25% of their budgets on off-campus activities. By 1984 ICRISAT expects this figure to rise to 30% because of expansion of its off-campus programmes.

171. The programmes of the various Centres are sufficiently different as to make it impossible to suggest an optimum percentage of either the budget or of the staff that should be allocated to off-campus activities. It should be recognized that expansion in off-campus activities is a logical development as Centres get more mature. This trend should, however, be reversed as the research capability of national systems increases to the point at which they can undertake collaborative projects which do not involve staff outposted from the IARCs.

172. As the Consultants talked with members of the Centre staff posted away from headquarters, a number of them mentioned that they would appreciate more frequent visits from their programme leaders. Some field staff felt that they needed to visit their respective Centre headquarters more frequently than they are now doing. This indicated that perhaps the duties at headquarters were too heavy, or that the size of the off-campus programmes were larger than the Centres could really administer. This would indicate that the Centres Directors should reassess the situation to determine how serious it may be as influencing field staff morale and working effectiveness.

4.2 Off-Campus Activities and the CGIAR Donors

173. Since many off-campus activities are supported by (or were started with) special projects, individual CGIAR members play an important role in their development in specific countries. Sometimes the initiative for the development of a national project comes from the country itself and/or from the IARC; sometimes it comes from a donor. The priority of the Centre and those of the donors as to the countries where special projects should be started do not always coincide and sometimes may not actually satisfy entirely the requirements of the country concerned. Although in the majority of cases these differences have been resolved several problems arise from time to time:

(i) The IARCs do not consider themselves as technical assistance agencies and therefore do not want to engage in special projects which are not closely related to the basic objectives of their mandate. Their projects should not only be beneficial to the country but also to their programme as a whole. While CGIAR members tend collectively to set limits to the growth of the Centres, they also sometimes put pressure on an institute to engage in off-campus activities which go beyond their mandate crops and also beyond agricultural research and deal with the application of research to agricultural development and production.

(ii) In other cases, the bilateral and multilateral institutions may wish to use the scientific staff of the Centres for short-term consultant missions, training courses, seminars and workshops, thus diverting staff from the basic research programme as approved by their governing bodies.

(iii) The involvement of a single donor in a special project may result in the requirement that the donor country uses its own staff, equipment and facilities for the project. This is generally welcome when the donor also provides the logistical support and infrastructure; it may, however, restrict the flexibility which the Centre and the country concerned would like to exercise in planning and managing a certain research task.

(iv) The diversity of the interests of the donors in research and development fields and the large number of countries covered could tend to over-extend the off-campus activities of the Centres beyond their managerial capacity if each Centre Director and its Board were to take up all of the opportunities offered. Some Centres have established guidelines to deal with this problem and it is clear that the Centres and their Boards will have to play also an increasingly selective role in launching off-campus activities. In this context it should be recalled also that

the CGIAR Review Committee had recommended that any special project proposal of a sizeable magnitude should also be examined by TAC. Some Centres felt that this was not practicable; it is recommended, however, that all special projects should be reported in the budget proposals of the Centres.

(v) Although the interests of the donors are quite diverse, it should be noted that some developing countries receive particular attention from them and therefore from the IARCs. Others for political or other reasons, seem to be left outside the network of those who benefit from the special projects of the IARCs. The number of countries where IARCs have conducted special projects is relatively limited and their choice seems to have been dictated largely by opportunities and potential for impact. Some of the small, less developed countries seem to have been relatively less supported.

174. Two recommendations emerge from the above: first, that the donors and the IARCs should work closely together to ensure that special projects are relevant to the central research mandate of the institute and do not overstrain its absorptive capacity. The second recommendation relates to the geographical spread of the special projects in developing and developed regions. This should be kept under careful review by the Centres, region by region to avoid serious gaps or imbalances.

4.3 Off-Campus Activities and ISNAR

175. It is recognized that the various agricultural research systems in the developing countries have different capabilities or levels of development. However, with different emphases needed in order to develop national research programmes in countries at varying stages of development, the appropriate components which may require strengthening are: planning, staff development, technical assistance, physical development and the orientation of research towards the farmers. The corresponding tasks within the CGIAR system are probably better carried out by a close co-ordination among IARCs, donors and ISNAR.

176. The off-campus activities conducted by the IARCs, especially those with well established research programmes, represent in several cases large country projects which are substituting for national efforts in the developing countries. When national capabilities were weak this was found to be an appropriate way for the Centres to transfer improved technology and to attempt concurrently to build national research capabilities. As such capabilities develop, the IARCs activities can be limited to those for which they have comparative advantages. These include, within their respective fields of competence;

a. the development and conservation of germplasm collections;

b. international exchange of germplasm;

c. staff training;

d. creation of links among researchers in different countries and promotion of the exchange of materials and information;

e. assistance in providing continuity in research which, in some instances, may not be possible to obtain under national programmes for financial and/or political reasons;

f. strengthening specific elements relative to their mandates.

177. Many donors are engaged in bilateral and multilateral projects to develop and strengthen national capacities in developing countries. In most of the cases their efforts are concentrated primarily in providing technical assistance, training and physical facilities development. Many of these projects, however, are not tied to the IARCs and good opportunities to avoid duplication and to maximize the use of available capabilities are lost.

178. To carry out these projects, in general, the donors prefer to use their own staff or recruit experts directly from the international market rather than financing the IARCs to contract the staff under bilateral contracts. It is not infrequent to observe donors competing for trainees urging that they go to the donor countries for training, although the courses offered are often not fully relevant to technical needs or to staff development planning of the country concerned.

179. The purpose of ISNAR is to help national governments in the analytical and planning stages of programmes designed to strengthen their agricultural research capabilities in developing countries. This includes assistance in identifying research problems and formulating research strategies and policies, assistance in building up an adequate institutional infrastructure and other research facilities as well as in promoting but not executing specific national or regional research programmes. The ultimate goal is to enable developing countries to plan, organize, manage and execute research more effectively from their own human, natural and financial resources. In performing these functions, ISNAR will serve as a linkage mechanism between the International Agricultural Research Centres of the CGIAR system and national agricultural research institutions. It will also liaise closely with FAO, regional organizations, bilateral agencies and others to maximize the benefits of technical and financial support to national programmes in complementary efforts. Where appropriate, it may contribute towards the coordination of outreach activities of the International Centres and others and national research efforts and assist in channelling the results of research activities from International Centres to national institutions. Clearly, the International Centres will have to continue to cooperate directly with national organizations to test and validate their

research findings and to implement other aspects of their programmes. In recent years the Centres have come under considerable pressure to provide assistance to national research programmes which sometimes exceeds their own mandates and best interests, but which they find difficult to refuse in view of the urgency of the needs. In future, developing countries can turn to ISNAR rather than the Centres for at least a portion of such assistance. To the extent that ISNAR is successful in contributing to the development of stronger national research programmes, it will facilitate and make more effective the cooperative programmes of the Centres. Conversely, ISNAR will find it important to be able to call on the Centres on behalf of its client countries for training requirements and specialist expertise which the Centres are best able to provide within their mandates. A second main function of ISNAR will be to serve as intermediary between interested partners in order to promote bilateral cooperation in the field of agricultural research. Assistance will be provided to promote cooperation in technical, managerial and financial fields.

180. ISNAR should be useful to the long-range planning of the Centres in providing comprehensive and up-to-date information on the different national programmes. Most of the IARCs, however, find it premature to pass judgements on the ways and means by which their off-campus activities will relate to those of ISNAR.

181. The mandates of ISNAR and of IFPRI involve these Centres in advisory activities at the national planning and policy levels and on the making of recommendations on these issues. Thus the range of activities suggested in the 1977 CGIAR Review for cooperative activities between IARCs and national programmes needs to be amended to take this into account. This has been done in the Table.

4.4 Off-Campus Activities of IARCs and other Assistance Agencies

182. Although the Terms of Reference of the analysis ask for consideration of the relative roles of the IARCs and ISNAR, a number of other agencies such as FAO, IADS and IICA also have wide experience in the planning and organization of national research systems and have on-going institution building, research and development projects in many developing countries. It seems, therefore, that collaboration between the IARCs and such agencies should be actively pursued in order to:

(i) enhance the strengthening of national research capabilities;

(ii) avoid unnecessary duplication among agencies; and

(iii) assist in the integration of the research efforts of the IARCs through cooperation between the IARCs and development assistance agencies.

183. Development assistance agencies could often have comparative advantages over the Centres in identifying obstacles and constraints in national agricultural delivery systems. Through their regional and

Table. Range of Cooperative Ac[illegible]

Appropriate	Sometimes Appropriate	Inappropriate
Partecipation in national research programmes to further the centres' research mandate and to assist in the development of the national research capacity. Such activities might include:	On-farm trials to demonstrate the applicability of a centre's new technology	Management of national research organization
Evaluation of promising new breeding material for adaptation, productivity, and pest tolerance	In-country training of production personnel and advice on production systems	Participation in full time extension and delivery activities
Two-way exchange of superior breeding lines from international and local testing programmes	Consultation on problems relating to regional or country production problems	Management of national agricultural production programmes
On site evaluation of biological and socioeconomic constraints to farm production and studies of the consequence of new technology	Assistance in the development of a national research institute involved in research and extension in a commodity or technology of direct relevance to centre	Responsibility for general technical assistance projects
Testing key components of farming systems and evaluating farm machines suited to the needs of the small farmers	Advice on research organization, staff recruitment, personnel policies and equipment	Making recommendations to national governments on agricultural economic policy and related issues
Identifying potential trainees and training trainers in research and production at regional centres or in conjunction with country programmes		
Staff visits and sponsorship of workshops and conferences at regional and country centres to disseminate results and technical information		
* For ISNAR: Advice on research organization staff recruitment, personnel policies and equipment		
* For IFPRI: Making recommendations to national governments on agricultural economic policy and related issues		

Excerpt from the "CGIAR Report of the Review Committee, Jan. 1977" with additions *

national representatives they could also provide logistic support to the IARCs and facilitate easier and faster exchange of seed material and information between IARCs and national programmes.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

184. The Terms of Reference were comprehensive and called for detailed analysis and assessment of complex and diverse situations. The time allowed for the Consultants' mission was short and did not permit the situation in each country visited to be examined as fully as the Consultants would have wished. Considerable amounts of additional information and views from the Centres, some developing countries, TAC members and one major donor were presented at the Workshop held at CIMMYT (see Annex D for list of participants) and these have been taken into account in this report.

185. Some difficulties were encountered in devising a system of classification for the off-campus activities and, in the event, a relatively simple but arbitrary classification was used. The categories within this classification are not mutually exclusive and the wide diversity of off-campus activities made their allocation to specific categories rather arbitrary.

186. Particular difficulty was encountered in placing the findings of the analysis in perspective and in projecting the future course of developments as required by para 2 (e) of the Terms of Reference. This difficulty arose because the Consultants did not have a precise statement of the long-term objectives of the CG system as a whole and how each Centre is expected to contribute to the attainment of these objectives. The concept put forward by the CGIAR Review Committee of 'global leadership among Centres in research on a particular commodity or commodities' and extended to involve farm systems and economics aspects was used as a guide. In addition, the views expressed in some quarters that the success of the CG system will ultimately be judged by its contribution to the development of agricultural research systems at national level so that they may become equal partners in a global agricultural research organization have been taken into account. Within this fully cooperative system the Centres would be expected to retain a major role in pioneer research developments.

187. The Consultants were also cognizant that quite rapid changes are taking place within the CG system as a whole but in particular in the establishment for the first time of ISNAR, a Centre with prime responsibility for assisting in the development of national agricultural research systems as a whole. This extends the present collective role of the Centres which up to now has been restricted to strengthening those components of national systems in which they had comparative advantages over other institutions. Furthermore the national research capabilities in some countries are already strong and in others they are developing

quite quickly, so that they are becoming increasingly able to carry out substantial research programmes or parts of programmes on a fully co-operative basis among themselves and with an IARC as one of the co-operators with particular input responsibilities.

188. For the first time the rate of increase of funds available from donors to the CG appears to be slowing down and it now appears unlikely that the projected developments at the IARCs can proceed at a rate envisaged a year or two ago. While it was not indicated in the Terms of Reference that this should be taken into account by the Consultants in arriving at suggestions for the future development of off-campus activities, it was quickly recognized as a major factor especially at a time when there are increasing demands from developing countries for the Centres to increase their participation in the development of specific components of the countries' agricultural research systems.

5.2 General

189. The distinction between on-campus and off-campus appears to be a somewhat arbitrary division based on location rather than programme content. Since all the work of the Centres is for the benefit of producing countries as a whole, the most important issue seems to be whether the programmes are relevant to the countries' needs and are being carried out in a cost effective manner. The locations at which work is done, whether by the Centres or by cooperative efforts in national programmes on particular programme components, is determined by the needs of the work and the facilities available to do it effectively. These considerations are responsible for the very wide diversity of Centre activities and their geographical spread and reflect the essential flexibility in the response of the Centres to meet the requirements of complex and changing situations.

190. Given the wide difference in mandates among Centres and that the nature of the programmes to be done is of greater importance than where the work is to be done, no guidelines can be established for the balance between on-campus and off-campus activities which would be applicable to all Centres. For each Centre, the decision can best be made by the Directors and staff with the support of their Boards.

191. Since the on-campus and off-campus components within a particular programme are essential and complementary parts of it, economies or changes can rarely be made in one part without adversely affecting the programme as a whole. Hence, in a period of financial stringency, it is rarely possible to make across the board reductions in all programmes without adversely affecting the work as a whole. This means in effect that within a Centre, priorities must be set between programmes and forward projections of essential developments (now being prepared) should be made. These considerations are outside the Terms of Reference of the stripe analysis but, nevertheless, make it unrealistic for conclusions to be derived from an analysis on part of a system about the future of that part of the system, in isolation from a consideration of the system as a whole.

192. The development of effective research systems at national level has long been recognized as essential if full use is to be made of the excellent results flowing from the IARCs. With the establishment of ISNAR within the CG system, the role of the other IARCs in the development of national research systems may need more precise definition. The role of the IARCs might be restricted to technical support in those subjects in which they have comparative advantages over other institutions, while ISNAR could assume responsibility for organization and management aspects of national research systems which could also include components not within the mandates of existing IARCs. This proposition should be extended to include all projects, regardless of sponsorship (FAO, IFAD, Ford and Rockefeller Foundations, etc.), aimed at developing research systems at national level and would lead to the IARCs becoming the logical source of technical support in their several fields.

193. In the context of increasing demands for IARC involvement in national programmes, it is considered to be essential that the long-term scientific work of the IARCs should not suffer as a consequence of the move towards greater involvement at national level even though there is a substantial body of results and of materials already available at the Centres for further development at national level.

194. One of the most difficult questions would appear to be that of deciding on the nature of a Centre's participation at national level and, in particular, at what stage in the development of the national research system, Centre staff should be withdrawn from the country. Only one Centre has so far addressed the question of what might be called the 'equilibrium' size of a Centre. A logical progression would seem to be through the development of national programmes through regional research programmes to regional liaison type operations and finally to regional networks of collaborating national institutions with a regionally appointed liaison officer (not from the Centres). Such a progression would allow IARC staff to work in other areas without necessarily effecting economies but such a process would indicate how the overall size of a Centre might be contained.

5.3 International Testing Programmes

195. The ITPs are essential parts of IARC programmes. They should continue with increasing participation of scientists from national programmes in the selection of the materials to be tested. To ensure that sound results are obtained each country should be encouraged to restrict its acceptance of nurseries to that total quantity which can be handled effectively with its available resources. The two-fold purpose of these programmes, i.e. the evaluation of standard nurseries and the provision of specific nurseries for a particular country, results in each country making a contribution to the general pool whilst being completely free to choose specific nurseries to meet its own requirements. This dual function should perhaps be emphasized.

5.4 National Projects

196. The wide diversity of Centre activities in national programmes is considered to be fully justified and to reflect the essential flexibility in the response of the Centres to meet a complex and continually changing situation. It is generally agreed that strengthening of national research systems is an essential item in the promotion of agricultural development and the Centres have been active in those components within their respective mandates. Individual IARCs have established guidelines for working in national programmes and these follow closely those given in the 1977 CGIAR Review. Changes are recommended to the guidelines in current use to accommodate the mandates of IFPRI and ISNAR. It should be re-emphasized that the role of the IARCs should be essentially that of technical support in their specific and mandated fields rather than a managerial role in national research programmes in the overall sense. To avoid some of the problems which have arisen in the past, maximum and more formal participation of national scientists and administrators in the planning of IARC involvement in national programmes should be ensured. The value of senior level contacts between the Centres and Government officials is recognized and is encouraged to continue.

197. To ensure the orderly development of the involvement of the IARCs in national projects efforts should be made to plan these well in advance so as to indicate where further resources (usually non-core funds) could be used most effectively. While most projects at national level are funded from non-core sources and some Centres feel that this should be the rule, the different staff development concepts amongst Centres make such a firm rule undesirable. However, there are core budget implications in these differences in concept and these are well recognized.

5.5 Regional Programmes

198. Several different types of regional programmes are recognized, the main ones being technical liaison or service type functions to a group of countries and core programme research work carried out on a regional basis which is included as core research off-campus in this analysis. This should be accepted as a normal evolution of the Centres and should be supported provided that such programmes do not overburden Centre management. Generally, the two main types of regional programmes are developed when the national research systems already have a minimum capability in the particular fields. Because of the varied nature of the programmes a range of criteria have been used to determine the number, location and size of these programmes and these criteria appear to be appropriate. Each situation must be judged on its merits with full realization that such programmes are quite expensive, particularly of time of the programme leaders. When national capabilities have developed sufficiently in several countries in a region these countries should be encouraged to form a cooperative network with the appropriate Centre as a cooperator and with a locally appointed liaison officer along the pattern recently established by one Centre.

5.6 Core Research Programmes outside the Host Country

199. It is essential for the Centres to conduct core programme research outside the host country when the environmental conditions within the host country are not representative of substantial areas where the particular crops are grown. The forms which these programmes take are very varied but wherever possible it is recommended that full use be made of national staff and facilities. Since these programmes are designed to contribute to the Centres' research and training objectives they qualify for core funding. Programmes of shorter or limited duration would usually be funded as special projects but no rigid rules should be applied.

5.7 Collaborative research programmes

200. Collaborative research programmes are carried out between IARCs and national systems in developing countries, when the latter have a sufficient institutional capability, to study problems of mutual interest in specific agroecological zones. These programmes should be given every encouragement including assistance with obtaining the small amounts of money to cover particular and essential items of cost (usually equipment), where such assistance is needed.

201. Similar arrangements are also made with specialist institutions in the developed countries for particular pieces of research work when specialized facilities are needed. Usually the direct costs are met by the host country but there are indirect costs to the Centre. Centres are urged to continue to ensure that such collaborative programmes are closely related to the major research problems with which the Centre is involved and donors are encouraged to support such research.

5.8 Collection of Information and Data

202. Collection of base line data and information, though essential, is often an expensive operation and Centres should generally seek co-operative arrangements with national and international organizations competent in these fields. It is recommended that the Centres should co-operate among themselves whenever possible and that the data and information so collected be kept in a readily available form in cooperation with the international information systems.

5.9 Germplasm Collection

203. The crop oriented IARCs have made substantial germplasm collection as a basis for their breeding programmes. Since modern plant breeding programmes tend to narrow genetic diversity in field grown varieties, the IARCs are urged to continue to collect and preserve germplasm of the crops for which they have responsibility to widen still further the genetic diversity available to plant breeders. They should take full advantage of the assistance which IBPGR can offer. It is absolutely essential that this work should continue despite the high cost involved.

5.10 Training and Follow-up

204. Training at all levels is an important function of the IARCs and is often rated as being of the highest priority by staff in national programmes. So far, most of the courses have been given at the Centres but there is a move towards holding these at regional and national level using both facilities and staff of appropriate national institutions and this should be encouraged. Extra care should be taken to follow established national procedures when selecting and inviting participants for courses and meetings of all kinds. The Centres should continue to ensure that the quality of the trainees is such that the high standards can be maintained.

205. The emphasis which is given to training and to follow-up activities once the trainees have returned to their own countries is entirely justified and must retain a high priority in the Centres' programme.

5.11 Consultations and Consultancy Services

206. The Centres presently give advice to national programmes on an informal basis whenever this is reasonably possible. It is recommended that this should continue but that the Centres should not set up formal consultancy services. The existence of other technical assistance agencies and more recently, the establishment of ISNAR, should make it more and more possible for the Centres to confine their advice essentially to technical rather than overall organizational and management topics.

5.12 Balance of On-Campus/Off-Campus Activities

207. It may be regarded as a normal evolution of Centre programmes for off-campus activities to increase. Initially this may lead to an increase in the numbers of outposted staff but as national research capabilities increase, full use should be made of these to keep the numbers of outposted staff to the minimum needed to have an effective programme.

208. Because of the different stages of development of the Centres and of the national research systems in the countries which they serve, the proportion of off-campus to on-campus activities may be expected to vary widely from Centre to Centre. It is not possible to suggest what the optimum proportion should be.

209. The present trend towards regionalization of activities by some Centres apparently on a Centre by Centre basis rather than as a cooperative (between Centres) exercise may also need to be reviewed. Since it appears to be the policy of the IARCs to work within national systems (which may need strengthening) rather than to establish independent regional Centres, there is perhaps scope for even further cooperation and, hopefully economy, by combining the development of these regional activities with the development of the national system in the chosen

country (ISNAR and/or others) to try to ensure that the national system is fully capable of supporting the regional activities of the Centres and to avoid staff of the IARCs being unduly involved in the O and M aspects of the national system.

5.13 Off-Campus Activities and CGIAR Donors

210. Many of the off-campus activities of the Centres are supported by or were started with special project funds. To assist in maintaining an appropriate balance within research and liaison programmes as a whole, it would be helpful if all special projects in which the Centres are engaged or which are in the formative stage could be included in the budget proposals of the Centres and this should be noted by potential and actual donors.

5.14 Off-Campus Activities and ISNAR

211. There is full agreement that national research capabilities require to be developed. The Centres have limited mandates in this connection and with the establishment of ISNAR it seems reasonable to propose a full collaboration between the Centres and ISNAR with the role of the Centres being essentially in the technical support and training field and ISNAR in the planning and development of the research system as a whole.

5.15 Off-Campus Activities and Other Development Agencies

212. The concept in para 211 should be extended to improve the co-operation between the Centres and other development agencies, including FAO, IFAD, the Foundations and bilateral donors.

5.16 Concluding Observations

213. The management of off-campus activities is a considerable burden for the IARCs. As their growth is a logical and essential development if national capability is to be developed, each Centre may need to reexamine its organizational structure and management procedures in this light. It is clear that there are limits to the capacity of the research staff at headquarters to supervise and backstop an increasing number of off-campus activities. Decentralization and full delegation of responsibilities to both regional staff and to national institutions should be given increased consideration.

214. The above observations and recommendations have been presented with the objective of further enhancing the impact of activities which are generally recognized as being extremely useful to the countries visited and efficient in their implementation. The Consultants who have visited the countries where off-campus activities are conducted have been impressed by the high regard in which the Centres are held by staff of the national programmes.

215. They are also conscious of the complexity of the operations by which Centres promote a wide range of activities in many countries. They wish to record their praise for the fine work carried out by the outposted staff of the IARCs. They also wish to assure the members of the CGIAR of the quality and effectiveness of these activities which fully warrant their continuing support.

216. They invite the members of the CGIAR to use the mechanisms of the CGIAR to maintain frequent consultations not only with the IARCs individually but also among themselves so as to continue to make optimum use of the system in the promotion and harmonization of these off-campus activities in the context of their own bilateral or multilateral activities in developing countries.

ANNEX A

PROCEDURES

1.1 The Preparatory Desk Study

1. The first step in the analysis was a desk study by the TAC Secretariat of the information and documentation sent by the IARCs on the subject. This study helped TAC to define the scope of the stripe analysis, the terms of reference and to identify a list of questions to be addressed by the analysis. TAC reviewed the results of this desk study at its 22nd Meeting in July 1979 at Hyderabad. It established the terms of reference given in para 4 of the main report; these were supplemented by the list of questions which is given in Annex B.

2. While approving the terms of reference and list of questions, TAC felt that there was still considerable imprecision in the information gathered from the Centres as to the terminology used for different types of off-campus activities, their scope, objectives and rationale. It was considered essential to arrive at a common classification framework before embarking in the more substantive steps of the analysis.

3. A questionnaire was sent, therefore, to all the IARCs asking them to classify their off-campus activities into significantly different categories and to provide information on their rationale, their objectives and programme contents. TAC also requested the Centres to explain how they see their future relationships with ISNAR.

4. Although the responses to the questionnaire were requested to be in the hands of the Secretariat in September 1979, most of them were late, the last reply arriving late December. These replies varied considerably in their degree of details and contents. Meanwhile, the CGIAR had been informed of the progress at its meeting of November 1979 and members of the Group stressed the importance of preparing a comprehensive compendium of the ongoing activities which the Centres are conducting outside their campuses with different sources of funding.

1.2 The Consultants Mission

5. Between November 1979 and February 1980, three persons were engaged to serve on the stripe analysis team. They were, Dr. Robert F. Chandler, Jr., the Director Emeritus of IRRI, Dr. Fred Haworth, an agricultural scientist and consultant from the U.K. and Dr. Almiro Blumenschein, a Brazilian agricultural scientist and Vice-Chairman of TAC.

6. This group of three met in Rome in February 1980 for briefing with the Secretariat who had at that time prepared a progress report to TAC* and a detailed analysis of the replies received from the IARCs.**

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* AGD/TAC:IAR/80/11
** AGD/TAC:IAR/80/13

The group also spent an hour and a half discussing the analysis with the TAC, which was in session at that time.

7. It was agreed that the field visits by the team would be divided up, with Dr. Haworth visiting IITA and a number of the off-campus activities of the Centres in Africa, Dr. Blumenschein visiting CIMMYT, CIAT and CIP, and off-campus programmes of the Centres in Latin America, and Dr. Chandler would visit IRRI and ICRISAT, and off-campus activities of the Centres in Asia. It was further agreed that the survey would be confined to those Centres which had a substantial off-campus programme, i.e. IITA, CIMMYT, CIAT, CIP, IRRI and ICRISAT.

8. The field trips were made during March, April and May and the three members of the team met in Washington, D.C. from May 12-16 to write the final report. Mr. P.J. Mahler, the Executive Secretary of TAC, was also present in Washington to assist with the preparation of the report. The CGIAR Secretariat staff provided the secretarial help required.

9. The locations and dates of the itineraries of the three members of the team and the names and titles of the people whom they met are given in Annex C.

10. Since the first point under the terms of reference specified that the team obtain a complete inventory of the off-campus activities of each Centre, a compendium is being prepared covering not only each of the six Centres visited but also others which provided information on their activities.

1.3 Workshop

11. The draft report prepared in Washington, though lacking the Section on main conclusions was circulated to the Centre Directors who were asked to correct errors of fact, to members of TAC and to other persons who were invited to a Workshop held at CIMMYT on 25-27 June, 1980. At this Workshop the views of the participants were made known in meetings of the group as a whole and in working groups which dealt in more detail with different parts of the draft report. The list of participants is given in Annex D.

12. The Consultants found the Workshop extremely useful and many of the suggested modifications and clarifications of presentation made by the meeting were incorporated into the text. No separate report of the proceedings of the workshop will be issued. The revised draft of the consultants report was presented to TAC on 4 July 1980 during the 24th Meeting held at CIP.

ANNEX B

LIST OF QUESTIONS

1. What are the main reasons for IARCs off-campus activities? These may include: (i) the main headquarters site is not representative of the whole range of environments on which the Centre is working; (ii) the Centre wishes to promote regional cooperation and links with its programme; (iii) the Centre wishes to gather information at national level on a particular problem of general importance; (iv) the Centre wishes to disseminate its technology, help national research programmes and have a feedback to its own research programme.

2. What are the criteria for deciding/selecting different forms of off-campus activities?

3. What are the optimum size and duration of off-campus activities in one country as seen by the IARCs? As seen by the country?

4. What are the views of national governments on IARCs' off-campus activities? Have they a preference for cooperative national programme or participation in regional network?

5. What are the views of CG donors on IARCs' off-campus activities? How are these influenced by the relative availability of funds for special projects as compared to Centre core programmes?

6. Are the criteria established by the CGIAR Review Committee for core and non-core funding of off-campus activities still valid? Are these actually applied by the IARCs?

7. How should off-campus activities of IARCs evolve with time and in relation with on-campus activities?

8. What are the alternatives to off-campus activities of IARCs? What are the IARCs comparative advantages?

9. How will the programme of ISNAR affect future off-campus activities of IARCs? Specifically, to what extent is CG funding to ISNAR-operated projects likely to affect support to cooperative country programmes of the IARCs?

10. What is the nature and scope of collaboration between IARCs in various regions/countries? To what extent can collaboration be strengthened?

11. What is the proper role of IARC regional or national cooperative programmes in promoting increased integration and coordination of all bilateral and multilateral R & D projects within a region/country? Specifically, to what extent do IARCs coordinate off-campus activities with FAO regional/country projects?

12. What are the comparative costs of headquarters staff and outposted staff, both at the senior scientist and support staff levels?

ANNEX C

LIST OF PLACES VISITED AND PEOPLE MET

1) by Dr. Robert F. Chandler, Jr.

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
Rice Department, Ministry of Agriculture, Thailand (27 March 1980)	Dr. Ben Jackson, IRRI's Liaison Scientist Dr. Derk Hille Ris Lambers, IRRI's Deep-water Rice Breeder Mr. Raymond C. Fischer, IRRI's Associate Agricultural Engineer Dr. Phairot Soponarat, Chief, Rice Division, Ministry of Agriculture Mr. Sermsak, Ass't Chief, Rice Division, Ministry of Agriculture Mr. Chak Chakkaphat, Agricultural Engineer Mr. Sannao, Director, Engineering Division, Ministry of Agriculture Mr. Suvit, Rice Breeder (upland rice) Mr. Chai, Rice Breeder (deep water rice) Mr. Chorb, Head, Soil Fertility Section of Rice Division
Bangladesh Rice Research Institute (BRRI), Joydevpur, Bangladesh (28 March 1980)	Dr. H.A. Zaman, Director, BRRI Dr. Munshi Siddique Ahmad, Associate Director, BRRI Mr. Nural Islam, Agricultural Engineer, BRRI Mr. Abdul Ghani, Irrigation Engineer, BRRI Mr. Md. Nasiruddin, Plant Breeder, BRRI Mr. Ahmed Hussain, Rice Production Specialist, BRRI Mr. Ahmed Nizam Uddin Ahmed, Rice Cropping Specialist, BRRI Dr. Frank Sheppard, IRRI Representative in Bangladesh and IRRI Team Leader Dr. Peter Hobbs, IRRI's Rice Cropping Systems Specialist Mr. Thomas Brackney, IRRI's Rice Production Specialist (training and applied research) Mr. Glen Peterson, IRRI's Agricultural Engineer (Dr. Dwight Kanter is IRRI's Deep-water Rice Breeder, but was in Thailand attending a conference on deep-water rice research, so he could not be interviewed).

by Dr. R.F. Chandler Jr., (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
New Delhi, India (30-31 March & 1 April 1980)	Dr. Matthew Dagg, IRRI's Liaison Scientist in India Dr. Takumi Izuno, CIMMYT's Regional Representative for Maize Research Dr. Ernest Sprague, Director, Maize Program, CIMMYT (Dr. Sprague happened to be in India at the time of Dr. Chandler's visit) Dr. J.S. Kanwar, Associate Director, ICRISAT (Dr. Kanwar came to Delhi to meet Dr. Chandler to take him to Hissar to see the chickpea research trials) Dr. Hari Kishore, CIP's Regional Representative for India, Nepal, Bhutan and Bangladesh Dr. Eugene Staples, Ford Foundation Representative in India Dr. Norman Collins, Ford Foundation (Agriculture) Dr. Gautam, Director General, ICAR Dr. P.S. Lamda, Vice Chancellor, Haryana Agricultural University Dr. Jain, Director of Indian Agricultural Resear Institute Dr. Jojinder Singh, Project Leader, All-India Maize Improvement Project (and coordinator of CIMMYT's Maize Program in India) Dr. M.V. Rao, Project Leader of All-India Wheat Improvement Project (and coordinator of CIMMYT's Wheat Program in India) Dr. K.L. Mehra, Head of India's National Plant Genetic Resources Program Mr. Srinivasan, Administrative Assistant to
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) (2 - 4 April 1980)	Dr. J.S. Kanwar, Associate Director (Research) Dr. J.C. Davies, Associate Director (International Cooperation) Dr. Appa Rao, Botanist (Pearl Millet Genetic Res.) Dr. V.R. Rao, Botanist (Groundnut Genetic Res.) Dr. D.L. Oswalt, Head of Training Program Dr. S.K. Das Gupta, Information Services Officer Dr. J. Kampen, Principal Agricultural Engineer, Farming Systems Program Dr. M. Von Oppen, Principal Agricultural Economist

by Dr. R.F. Chandler Jr., (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
ICRISAT (2 - 4 April 1980) Cont'd.	Dr.R.J. Williams, Principal Pathologist (Pearl Millet) Dr. Lee House, Principal Plant Breeder (Sorghum) Dr. D.S. Murthy, Plant Breeder (Sorghum) Mr. Bholanath Varma, Plant Breeder (Sorghum) Mr. R.W. Gibbons, Principal Plant Breeder and Leader, Groundnut Program Mr. E.W. Nunn, Principal Agricultural Engineer, Farm Services Department
Peradeniya and Batalagoda, Sri Lanka (6 - 8 April 1980)	Dr. Walter Griffeth, IRRI's Team Leader in Sri Lanka Dr. Russell Freed, IRRI's Rice Breeder in Sri Lanka Dr. C. Panabokke, Director of Agriculture Dr. Walter Fernando, Deputy Director of Agriculture (Research) Dr. Henry Fernando, Director, Central Agricultural Experiment Station, Peradeniya Dr. S. Seneweratne, Plant Pathologist Central Agricultural Experiment Station Dr. D. Senadhira, Head, Rice Breeding Program, Batalagoda Rice Experiment Station Mr. M.P. Dhanapala, Rice Breeder, Batalagoda Rice Experiment Station
Los Baños, Philippines (22-23 April 1980)	Dr. N.C. Brady, Director General, International Rice Research Institute (IRRI) Dr. Marcos Vega, Deputy Director of IRRI, and in charge of international programs Dr. Harold Kauffman, in charge of IRRI's International Rice Testing Program Dr. Ritchie Cowan, IRRI's Liaison Scientist for Indonesia and Malaysia Mr. H.M. Beachell, IRRI's Rice Breeder in Indonesia Dr. Siwi, Director of the Sukamandi Rice Experiment Station, Indonesia Dr. I. Manwan, Director of the Moros Rice Experiment Station, Sulawesi, Indonesia

by Dr. R.F. Chandler Jr., (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
Los Baños, Philippines (22-23 April 1980) Cont'd.	Mr. Lindsay Harmsworth, CIP Representative for the Far East, S.E. Asia and the Pacific (Stationed in Los Baños) Dr. Ponciano Batugal, Director of International Programs for the Philippine Council for Agricultural Resources Research and the local coordinator for CIP's program Dr. Michael Potts, Agricultural Economist with CIP's program Mr. Artemio Salazar, Corn Breeder at the Institute of Plant Breeding, University of the Philippines. He is the principal coordinator of CIMMYT's maize improvement program in the Philippines

2) by Dr. F. Haworth

Tanzania, Dar-es-Salaam (13 - 14 April 1980)	Dr. John Anania, Project Officer Agricultural Research, USAID Dr. P.C. Duffield, Project Coordinator, IITA/USAID/ Tanzania Project Dr. B.B. Singh, Grain Legume Breeder, IITA Dr. Mazo Price, Grain Legume Agronomist, IITA Dr. N.S. Jodha, Agricultural Economist, IITA Dr. S.J. Mukuru, Sorghum Breeder, ICRISAT Ms. Malima (deputizing for Dr. Liwenga, Director of newly created Research Division in the Ministry of Agriculture) Dr. Khamisi, Director Crop Development Division, now to Administration and Extension Division
15 April 1980 - Morogoro, Faculty of Agriculture, Forestry and Veterinary Science	Dr. B.J. Ndunguru, Head of Crop Science Department Dr. David W. Sperling, Maize Breeder, CIMMYT Dr. James A. Deutsch, Maize Agronomist, CIMMYT Director of the Agricultural Research Station at Ilonga (recent appointee, name not noted)

by Dr. F. Haworth, (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
Addis Ababa (16 April)	on route to Nairobi met by Dr. J.K. Gitau, Director of Research, Ministry of Agriculture
Kenya, Nairobi (17 - 19 April)	Dr. J.K. Gitau, Director of Research (review of reports from station directors) - Planned visit to Katumani cancelled Dr. Majisu, Director designate Kenya Agricultural Research Institute (very brief)
18/4 - meetings at ILRAD (used as base by staff of other IARCs)	Dr. John Gerhart, Ford Foundation, Nairobi Dr. G. Kingma, Wheat Breeder, CIMMYT Dr. M. Collinson, Agricultural Economist, CIMMYT Dr. S. Franzel, Associate Agricultural Economist, CIMMYT Dr. M.B. Morales, Director Regional Programme,CIP Dr. Lenahan,Training and Outreach Director, ILRAD
meetings at Crop Science Department, Faculty of Agriculture, University of Nairobi	Dr. Muruli, Kenya Cowpea Project (Kenya Government with IITA) Dr. Mukunya, Kenya Pigeon Pea Project (IDRC finance, ICRISAT support)
19 April - visit to Katumani but Dr. M.D. Thairu was not on station	
Upper Volta, Ouagadougou (19 - 24 April 1980) Kamboinse Research Station	Dr. C.M. Pattanayak, Sorghum Breeder, ICRISAT Dr. P. Matlow, Agricultural Economist, ICRISAT Dr. Kanayo Nwanze, Entomologist, ICRISAT Dr. P. Lawrence, Millet Breeder, ICRISAT Dr. K.V. Ramiah, Cereal Breeder, Striga, ICRISAT Dr. V. Asnani, Maize Breeder, IITA Dr. F. Brockman, Soil Fertility (Cowpea) Agronomist, IITA Dr. Arlan B. McSwain, Programme Officer, USAID/ SAFGRAD Dr. G. Philippe-Auguste, FAO Country Representative Dr. Djigma Albert, Director, National Institute of Agricultural Research, Ministry of Higher Education and Scientific Research Dr. P. Christiansen, Production Agronomist, Purdue University FSR (SAFGRAD) Dr. Ram D. Singh, Agricultural Economist, Purdue FSR (SAFGRAD) Dr. J. Kabore (DSA), Ministry of Rural Development, Director of Agricultural Services
23-24 April - continuation of discussions with staff met on 21 and 22 April - drafting of outline reports Tanzania and Kenya	

by Dr. F. Haworth, (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
Nigeria, Ibadan (25 - 28 April 1980)	Dr. W.K. Gamble, Director General, IITA Dr. B.T. Kang, Assistant Director, Farming Systems, IITA Dr. P.R. Goldsworth, Assistant Director, Grain Legumes, IITA Dr. S.K. Hahn, Assistant Director, Roots and Tuber, IITA Dr. Soon K. Kim, Maize Breeder, IITA Dr. D. Goodman, Special Projects/Cooperative Programmes, IITA Dr. D. McNee, Maize Breeder (CIMMYT Liaison designate)

3) by Dr. A. Blumenschein

Lima, Peru - CIP (11 - 12 April 1980)	Dr. Roger Rowe, Deputy Director General Dr. Kenneth Brown, Director of Regional Programs and Training
Cali, Colombia - CIAT (13 - 15 April 1980)	Dr. John L. Nickel, Director General Dr. Werner Treitz, Chairman of the Board of Trustee Dr. Paulo de T. Alvim, Member of the Board of Trustees - CEPEC, Brasil - Research Director Dr. John A. Pino, Vice Chairman of the Board of Trustees Dr. Laing, Director for Crops Research Dr. Schoonhover, Leader of the Bean Program and Director for Land Resources Research
El Batan, Mexico - CIMMYT Cd. Obregon - INIA, CIANO (16 - 19 April 1980)	Dr. R. Havener, Director General, CIMMYT Dr. K.W. Finlay, Deputy Director General Dr. R.D. Osler, Deputy Director General & Treasurer Dr. E. Sprague, Director, Maize Program Dr. R.L. Paliwal, Associate Director Maize Program Dr. J.B. Barnett, Regional Staff Andean Region, CIMMYT - CIAT Dr. G. Granados, Regional Staff Andean Region, CIMMYT - CIAT Dr. S. Taba, Regional Staff in Ecuador, CIMMYT Dr. R.G. Anderson, Director, Wheat Program

by Dr. A. Blumenschein, (Cont'd.)

LOCATION AND DATE	NAME AND TITLE OF PERSONS VISITED
El Batan, Mexico - CIMMYT Cd.Obregon - INIA, CIANO (16-19 April 1980) Cont'd.	Dr. A.R. Klatt, Regional Staff Andean Region - Ecuador, CIMMYT Dr. M.M. Kohli, Regional Staff Latin America Southern Cone Region, CIMMYT Dr. D.L. Winkelmann, Director, Economics Program, CIMMYT Ms. E. Villegas, Quality Laboratory Dr. E. Alvarez Luna, Director General, INIA
Brasilia, Brasil - EMBRAPA (27-29 April 1980)	Dr. E. Rezende Alves, President Dr. E. Wagner, Director, Centro de Pesquisa Agropecuaria do Cerrado Dr. W. Goedert, Associate Research Director, Centro de Pesquisa Agropecuaria do Cerrado Dr. E. Pexoto Gomez, Director, Centro Nacional de Pesquisas, Trigo Dr. A. Carlos Baier, Researcher, Triticale Program Dr. M. Augusto Pinto Da Cunha Director, Centro Nacional de Pesquisas, Mandioca e Fruticultura Dr. D. Giacometti, Director, Centro Nacional de Recursos Geneticos Dr. R. Vencovsky, Director, Centro Nacional de Pesquisas, Milho e Sorgo
Ecuador, INIAP - visit to Headquarters, Exp. Station Pichilingue, Exp. Station Santa Catalina & on-farm trials (6-9 May 1980)	Dr. G. Merino, Director General Dr. J. Rivadeneira Director, Estacion Experimental Pichilingue Dr. M. Palma C., Chief of Maize Program, Pichilingue Dr. F. Brito, Researcher Pichilingue Dr. M. Burbano, Researcher Pichilingue Dr. A. Barcas, Researcher Pichilingue Dr. S. Crespo, Researcher Pichilingue Dr. F. Gavela, Director, Estacion Experimental Santa Catalina Dr. M. Galarza, National Coordinator of the Maize Program, Santa Catalina Dr. C. Villasis, Researcher, Santa Catalina Dr. F. Moreno, Researcher, Santa Catalina Dr M. Cabiedes Researcher, Santa Catalina

ANNEX D

TAC WORKSHOP ON OFF-CAMPUS ACTIVITIES OF IARCs

CIMMYT, Mexico, 25-27 June 1980

LIST OF PARTICIPANTS

Dr. Amir Muhammed, Chairman

Dr. Almiro Blumenschein, Consultant

Dr. Robert F. Chander, Jr., Consultant

Dr. F. Haworth, Consultant

TAC

Dr. Ralph W. Cummings, TAC Chairman

Mr. P.J. Mahler, TAC Executive Secretary

Mr. L.H.J. Ochtman, TAC Senior Agricultural Officer

Dr. L.T. Evans

Dr. D.M. Thairu

Dr. Mohamed S. Zehni

IARCs

Dr. John L. Nickel (CIAT)

Dr. R.O. Havener (CIMMYT)

Dr. Roger Rowe (CIP)

Dr. Harry S. Darling (ICARDA)

Dr. J.C. Davies (ICRISAT)

Mr. P.A. Oram (IFPRI)

Dr. William K. Gamble (IITA)
Dr. E.H. Hartmans (IITA)

Dr. Marcos R. Vega (IRRI)

Dr. George A. Paku (WARDA)

FAO

Dr. John H. Monyo

USAID

Dr. James L. Walker
Dr. Floyd Williams

OTHERS PRESENT

Prof. T. Ajibola Taylor

Dr. Enrique Ampuero

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THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

COMPENDIUM

OFF-CAMPUS ACTIVITIES

INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

TAC SECRETARIAT
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
August 1980

NOTE BY THE SECRETARIAT

This Compendium has been compiled by the TAC Secretariat from information supplied by the Centers individually as of August 1980. The information was included directly in the Compendium without amendment, since time was too short to re-check the whole document with the Centers prior to its issuance.

A second edition may be necessary to incorporate amendments which the Centers, TAC, the countries or donors concerned may wish to make on the format or contents of the document when considering the totality of the Centers' contributions to this Compendium. For example, some centers have reported training only in terms of that actually conducted off-campus while others have included a description of their training programs conducted on-campus as well.

The cooperation of the Centers in the preparation of this Compendium is gratefully acknowledged, especially as regards their observance of the guidelines which were finalized during the workshop held in late June and short deadlines given to them for sending their updated contributions.

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COMPENDIUM

OFF-CAMPUS ACTIVITIES

INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

I. INTRODUCTION

This Compendium of IARCs' Off-Campus Activities has been compiled as an Addendum to the "Report on the Stripe Analysis of the Off-Campus Activities of the International Agricultural Research Centres" 1/, to provide a comprehensive résumé of all Centres' activities of such nature.

The present issue is the result of the discussions of a first draft presented at a Workshop, held at CIMMYT Headquarters on 25-27 June 1980, in which participated the three TAC consultants who conducted the stripe analysis, several TAC members, most of the Centre Directors or their representatives and a Co-Sponsor's representative. In a personal capacity, there were also participants from developed and developing countries.

An outline of the Compendium, improved in the light of the Workshop's discussions, was then further discussed with Centre Directors in the 24th TAC Meeting and accepted as a model.

Centre Directors provided the TAC Secretariat narratives on their Centres' off-campus activities and also the summary tabulations. Those Centres which have not been included in this Compendium, either have no off-campus activities or their contribution did not reach the TAC Secretariat in time for inclusion when this document had to be sent for printing.

II. EXPLANATORY NOTES

The explanatory notes below refer to the respective columns of the tabulations, but include some cross-references to the narratives.

First column - "location":

- numbering relates to corresponding narrative sections of the IARC in question;
- if left blank, either no specific country involved, or too many countries involved to be listed.

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Second column - "off-campus activity":

- descriptive title of the activity/project.

Third column - "category":

- based on the classification of off-campus activities adopted by the consultants, subsequently amended by the Workshop and finally agreed upon by the 24th TAC Meeting, the following categories of activities have been adopted:

  A - International testing programme

  B - National cooperative projects, with outposted staff (usually non-core)

  C - Regional programmes

  D - Core research outside host country, with outposted staff

  E - Collaborative research
  E1 - with developing countries
  E2 - with developed countries

  F - Collection of information and data

  G - Germplasm collection, preservation and utilization

  H - Training and follow-up

  I - Consultancy services to national programmes

  The narratives of each Centre have been arranged according to these categories, and the capital letters preceding the definition of the categories have been used as a code in the tabulation;

- a particular activity may involve one or more categories.

Fourth column - "senior staff":

- (2 scientists) + 1 scientist: two already left, one in position;

- 2 scientists + (1 scientist): two in position, one expected to be filled.

Fifth column - "type" of funding:

- Coding used:
  - c - unrestricted core funding
  - rc - restricted core funding
  - sp - special project funding
  - l - funding through a loan

Sixth column - "amount" of funding:

- left blank if not specified by the Centre in question;
- if only the amount is indicated, it normally represents the total amount of funds for the entire duration of the project, unless indicated otherwise.

Seventh column - "duration - from .... to ....":

- left blank if not specified by the Centre in question;
- in places only number of years specified for the life of the project.

Eighth column - "donors":

- for acronyms see section III below.

III. ACRONYMS USED IN THE COMPENDIUM

AICRIP	All-India Coordinated Rice Improvement Project
AGCD	Administration Générale de la Coopération au Développement (Belgium)
CENARGEN	National Centre for Genetic Resources (Brazil)
CIAT	The International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CILSS	Comité Interétat de Lutte contre la Sécheresse dans les Pays du Sahel
CIMMYT	The International Maize and Wheat Improvement Center

CIP	The International Potato Center
COPR	Centre for Overseas Pest Research (UK)
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
DAAD	Deutscher Akademischer Austauschdienst
EMBRAPA	Brasilian enterprise for Agricultural Research
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IADS	International Agricultural Development Service
IBPGR	The International Board for Plant Genetic Resources
IBRD	World Bank
ICA	Instituto Colombiano Agropecuario
ICARDA	The International Center for Agricultural Research in Dry Areas
ICIPE	The International Center of Insect Physiology and Ecology
ICRISAT	The International Crops Research Institute for the Semi-Arid Tropics
ICTA	Instituto de Ciencia y Tecnología Agrícola (Guatemala)
IDA	International Development Association
IDRC	International Development Research Centre (Canada)
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
IITA	The International Institute of Tropical Agriculture
INIA	Instituto Nacional de Investigaciones Agrícolas (Mexico)
IRAT	Institut de Recherches Agronomiques Tropicales (France)
IRRI	The International Rice Research Institute
ISRA	Institut Sénégalais de la Recherche Agronomique
IVITA	Instituto Veterinario de Investigaciones Tropicales y de Altura
NIAE	National Institute of Agricultural Engineering (UK)
NCPC	National Crop Protection Council (Philippines)
NFAC	National Food and Agriculture Council (Philippines)
OAU	Organization of African Unity
ORSTOM	Office de la Recherche Scientifique et Technique d'Outre-Mer (France)

PCARR	Philippine Council for Agricultural Resources Research
PRECODEPA	Programa Regional de Cooperación en Desarrollo de la Papa (Central America)
RIDT	Royal Irrigation Department of Thailand
SAFGRAD	Semi-Arid Food Grain Research and Development Project
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WFP	World Food Programme

IV. OFF-CAMPUS ACTIVITIES - INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

Brief Narrative Account

and

Tabulated Information

Off-Campus Activities - IRRI

A [1/] International Testing

1. [1/] This is a major activity of IRRI. In 1979, for example, the IRRI-coordinated International Rice Testing Programme (IRTP) sent out more than 1,100 sets of nurseries (seeds) from two central points: 928 went from IRRI to 55 countries and 254 sets of the Latin American nurseries from CIAT to 21 Latin American countries. The nurseries included resistance to specific insects and diseases and tolerance to such factors as drought, adverse soil conditions and cold temperatures. The varietal testing programme includes materials from national programmes as well as from IRRI. This extensive worldwide programme is supported by UNDP with grants averaging during the period 1975-79 about $ 500,000 annually. Monitoring teams composed of IRRI scientists and scientists from national programmes visit these nurseries periodically.

B National Cooperative Projects

Indonesia

2. Strengthening National Research Capability

A USAID grant of $ 992,000 over a four-year period has enabled IRRI to station a team of five scientists in Indonesia to strengthen national research capabilities. The members of the team are a rice breeder, a cropping systems specialist, an agronomist, a soil scientist, and an agricultural economist. The responsibilities of the group include genetic evaluation of rice, cropping systems research, and studies of agro-economic constraints to rice yields.

3. Machinery Project

Activities in the project include providing assistance to mechanization currently underway and determining what might be done to make it more effective. Manufacturers are contacted for the production of IRRI-type machines/equipment for rice production. Assistance is given to redesigning or modifying the machines to make them meet local needs more effectively. Demonstrations and exhibits are put up to illustrate what could be accomplished by utilizing various sources of mechanization.

Bangladesh

4. Support for Bangladesh Rice Research Institute

1/ Letters and numbers refer to those in the tabulation.

The foreign support for the Bangladesh Rice Research Institute (BRRI) is channeled through IRRI. A team of five scientists are stationed there. They are a research system specialist and IRRI representative, a rice production specialist, a rice breeder (deepwater rice), an agronomist, and an agricultural engineer. Financial support for this project, amounting to $ 2,200,000 from 1 January 1978 to 31 December 1980, comes from three sources: the Ford Foundation, the Australian Government and the Canadian International Development Agency. The general objective is to aid in the development of BRRI until it is able to continue on its own.

5. Strengthening Rice-Based Cropping Systems Research Capability

A second project at BRRI is designed to develop research capability in rice-based cropping systems. One scientist is assigned to this project. His salary and operating costs are provided by a grant of $ 361,800 (Canadian) over a two-year period.

Burma

6. Strengthening National Rice Research Capability

The cooperative project aims to develop and implement strong inter-disciplinary programmes in rice varietal improvement, rice-based cropping systems, and machinery development and testing and to improve national capabilities in these and related research areas.

Pakistan

7. Small-scale Farm Machinery/Equipment

The Small Farm Machinery Industrial Extension Project has enabled IRRI to conduct economic and market evaluation studies to determine the potential of IRRI-designed machines; to determine their performance at selected locations; to provide continuous technical and in-country engineering assistance to their manufacturers; and to perform adaptive design and development work on those IRRI-designed machines which offer potential but lack sufficient compatibility in the original configuration to meet local farm-level needs. Pakistan through the Pakistan Agricultural Research Council is participating in the project. Among the machines that have received major attention are threshers and transplanters.

8. Applied Research Trials

The applied research programme is designed to demonstrate the feasibilit of greatly increasing rice production in farmers' fields. In 1978 the applied

research trials conducted in the rice-growing districts of the Punjab and Sind provinces included: a) nitrogen placement; b) direct seeding of rice; c) trials to correct zinc deficiency; d) insecticide placement; and e) double cropping (rice followed by wheat). Based on the results of the applied research trials a package of technology is being developed whose effectiveness will be demonstrated on a whole-farm basis.

Sri Lanka

9. Rice Technology Improvement and Training

The primary objective of the cooperative project is the organization and implementation of multidisciplinary research programmes on varietal improvement and cropping systems including field trials designed to accelerate the dissemination and adoption of new technologies.

Thailand

10. Small-Scale Machinery Project (Industrial Extension)

Thailand is another of the sites for the Small Farm Machinery Industrial Extension Project. The objectives of the project in Thailand are similar to those in Pakistan and the Philippines.

Philippines

11. Technology Transfer

The IRRI crop production specialist works with the Philippine Masagana 99 production programme. The transfer of modern production technology through agricultural extension is emphasized.

12. Small-Scale Machinery Project

The Philippines is one of the sites for the Small Farm Machinery Industrial Extension Project. The objectives of the project have earlier been enumerated.

C Regional Programmes

IRRI maintains several liaison scientists in various regions, as follows:

13. Indonesia and Malaysia; stationed in Bogor, Indonesia

14. Africa; stationed at IITA

15. Latin America; stationed at CIAT

16. India; a Ford Foundation employee serves as IRRI's liaison scientist in India

17. Thailand; an employee of the Rockefeller Foundation is IRRI's liaison scientist in Thailand

These scientists supervise and facilitate the operation of any collaborative research projects in their territory and pay particular attention to IRRI's network of testing, such as the International Rice Testing Programme with its various nurseries. They have close contact with government officials and assist in maintaining cordial relationships between IRRI and the cooperating governments and scientists. Liaison scientists are supported from core budget funds.

18. Cropping Systems Outreach

The project aims to increase food production in South and Southeast Asia through the identification and demonstration of more productive rice-based cropping systems. Specifically the objectives are: 1) to extend relevant methodology to farmer-participant in research and technology development for national programmes; 2) to provide reliable data from sites on the Asian agroclimatic grid to determine the potential for intensive cropping systems in each of the major rice-growing zones of Asia; 3) to facilitate exchange of information/experience among scientists; and 4) to provide a mechanism for joint programme planning and review between national programmes and IRRI.

D Core Research Programmes outside the Host Country

19. Deepwater Rice Project

IRRI has a deepwater rice project in Thailand, located at the Huntra station. One full-time scientist is assigned to this project. In 1979 IRRI budgeted $ 152,000 for this project, all from core funds. The rationale for locating this core project outside the Philippines is that there is no deepwater rice in the country, whereas there are extensive areas of it in Thailand. Furthermore, the Huntra Rice Station is designed specifically for deepwater rice research.

E Collaborative Research Projects

E1 With Developing Countries

Indonesia

20. Cropping Systems

The objectives of the cooperative cropping systems programme between the Central Research Institute for Agriculture, Indonesia, and IRRI are: a) to develop cropping systems for rainfed and partially irrigated rice areas; b) to adapt improved cropping systems through cooperative trials with farmers; and c) to train research and extension workers for active roles in cropping systems programmes in Indonesia.

India

21. Exchange of Germplasm, Breeding for Insect and Disease Resistance

The initiation of the collaborative project was a logical sequence to an earlier cooperative national (country) programme between the Government of India (through the All-India Coordinated Rice Improvement Project (AICRIP) and IRRI. While AICRIP has developed the necessary capability to carry on an efficient rice research programme for the country it was recognized that it would be mutually beneficial to continue to collaborate in finding solutions to problems of common interest. The project has two basic components: a) collaborative research on (1) collection and exchange of germplasm; (2) evaluation of germplasm; (3) biotype and strainal studies; and (4) crop production research and b) exchange of scientists.

Philippines

22. NFAC-National Crop Protection Centre Operations

The project has the same objectives as the technology transfer project but emphasizes the protection of the rice crop against insect pests and diseases.

23. NFAC-IBRD Resettlement Project

The resettlement project is a World Bank-assisted project of the Philippine Ministry of Agrarian Reform in the provinces of Agusan del Sur, Bukidnon and Capiz. The NFAC has responsibility for the overall agricultural development of the settlement areas. As such NFAC requested IRRI to provide technological support relative to the conduct of research in rice-based cropping systems in the resettlement areas.

24. Nutritional Evaluation Laboratory Project

The cooperative project is a joint effort with the Philippine Food and Nutrition Research Institute (FNRI). The objective is to investigate nutritional and acceptability problems related to rice-based diets in

in preschool children.

25. Organizing Small Farmers for Effective Use of Technology

The project is a cooperative effort between a number of Philippine institutions (Philippine Council for Agriculture and Resources Research, NFAC, National Irrigation Administration, Bureau of Plant Industry, and Bureau of Agricultural Extension) and IRRI. The rationale for the project is the realization that the potentials of the high-yielding rice technology requires a new level of collaborative organization among the small farmers of the Philippines. The project will examine how different ways of organizing small farmers help or hinder them in meeting these fundamentally organizational challenges.

Korea/Philippines

26. Collaborative Project on Screening for Cold Tolerance and Blast

At the beginning of each year Korean and IRRI scientists meet to discuss the previous year's results and to develop the work plans for collaborative research for the current year. For 1979 and 1980 the focus of the collaborative effort is on the rice blast disease and on cold tolerance

27. Collaborative Project on Gene Rotation

This is a joint effort to produce rice seeds in the Philippines during the winter season in Korea with the objective of shortening the rice seed renewal period from five to three years. The ability to renew rice seeds (variety/varieties) used by the farmers will ensure the implementation of the "gene rotation programme" for rice blast disease control in Korea.

Indonesia/Philippines/Thailand

28. Project on Consequences of Mechanization

Mechanization poses the following paradox: On the one hand the direct function of mechanization is often seen as the replacement of labour which is undesirable in labour-intensive countries. On the other hand mechanization permits faster, less laborious completion of farm tasks, is claimed to raise yields and permit greater intensity of land use and raise labour productivity and income. Thus the project will evaluate the effects of farm mechanization on small rice farms in selected locations in Asia. In addition the project will develop an improved understanding of the tasks involved in different systems of rice production to provide guidelines for the design of mechanization appropriate for rice producers at different stages of development.

Finally, the project will try to improve the capacity of researchers within the region to conduct such studies.

China/Cuba/Vietnam

29. Initiation of Collaborative Work with Scientists in Centrally Planned Economies

The special grant enables IRRI scientists and administrators to follow up initial attempts to include countries with centrally planned economies (e.g. China, Cuba, Vietnam) in the various research networks set up by IRRI, to provide their scientists the opportunity to participate in IRRI's conferences/workshops/training programmes, and to consider the possibility of developing special projects to support more extensive cooperation.

E2 With Developed Countries

USA/Philippines

30. Heterotrophic N-fixation

The goal of the project is to increase the nitrogen-fixing activity of the rice root zone in an effort to increase crop yield of small farmers and reduce their dependence on expensive chemical fertilizer. Emphasis is focused on biological nitrogen fixation in paddy fields by organisms such as blue-green algae, symbiotic blue-green algae with Azolla, and heterotrophic anaerobic bacteria.

G Germplasm Collection, Preservation and Utilization

31. Rice Germplasm Collection

The project is an accelerated field collection programme to cope with the rapid and widespread diffusion of the high-yielding varieties and the concurrent disappearance of traditional cultivars. The effort is being implemented in Bangladesh, Burma, China, India, Indonesia, Nepal, Sri Lanka, and Thailand.

IRRI has the world's largest collection of rice varieties and genetic lines, numbering approximately 60,000. This includes some 1900 varieties of Oryza glaberrima. Each accession in the collection is grown twice, and extensive notes are taken on the characteristics of each entry. This material is made available to rice breeders around the world. The rice germplasm collection, preservation and utilization programme is supported largely from core funds.

H Training and Follow-up

32. Regional Training

The training of young rice scientists has been an integral part of the Institute's activities since operations began in 1962. Fellows, scholars and trainees at IRRI number about 250 annually. Approximately 130 of these are research scholars or fellows, about 75 of whom are pursuing advanced degrees at the adjacent College of Agriculture of the University of the Philippines at Los Baños. The remainder are enrolled in shorter (two weeks to six months) courses in such subjects as genetic evaluation and utilization, cropping systems, agricultural mechanization, and rice production training. The UNDP regional training project enables IRRI to make available an additional 10 person-years of training to young and promising rice research workers in Asia.

IRRI has kept in close touch with its alumni. Many of them are now working in cooperative programmes around the world. In fact, no single factor has enhanced the success of its collaborative and cooperative programmes in rice-growing countries more than the contacts with and the assistance of IRRI alumni.

I Consultation to National Programmes

IRRI has no formal scheduled programme of consultation to national programmes. However, it carries on this activity extensively. Its scientists and administrators visit the national programmes around the world. IRRI invites rice scientists from all the important rice-producing countries to its international conferences and symposia. Their liaison scientists and other IRRI representatives stationed in foreign countries are in close contact with government officials and rice scientists. IRRI does not attempt to influence government policy, but, rather helps to solve the technological and sociological problems that limit rice production wherever they occur.

Table 1 :

IRRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Various	International Rice Testing Programme	A	2 Plant Breeders 1 Plant Pathologist	rc	7,738,000	Jan.80 Dec.84	UNDP
2. Indonesia;	Strengthening national research capability	B	1 Plant Breeder 1 Agronomist 1 Soil Scientist 1 Crop Syst. Agron. 1 Agric. Economist	sp	992,000	Oct.77 Dec.81	USAID
3. "	Machinery project	B	1 Farm Mach.Engineer	sp	313,000	Mar.78 Aug.80	USAID
20. "	Cropping systems	E1		sp	169,000	Oct.77 Oct.80	IDRC
13. " ; Bogor	Regional liaison (Indonesia & Malaysia)	C	1 Plant Breeder/ //Research Admin.	c	149,000	Jan.80 Dec.80	
4. Bangladesh; BRRI	Support for Bangladesh rice research institute	B	(1 Agronomist) + 1 Res. Syst.Specialist 1 Rice Prod.Specialist 1 Plant Breeder 1 Agric. Engineer	sp	2,624,000	Jan.78 Dec.80	CIDA, Australia, Ford Foundation
5. "; BRRI	Strengthening rice-based cropping systems research capability	B	1 Crop Syst. Agron.	sp	427,000	Jan.79 Dec.81	IDRC

Table 1 :

IRRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
6. Burma	Strengthening national rice research capability	B	1 Agric. Engineer 1 Plant Breeder 1 Crop Syst. Agron.	sp	2,084,000	Jan.79 Dec.82	CIDA
21. India; AIRCRIP	Exchange of germplasm, breeding for insect and disease resistance	E1		sp	200,000	June 79-June 82	Ford Foundation
16. " ; New Delhi	Liaison	C	1 Soil Scientist/ /Res. Admin.	c	27,000	Jan.80 Dec.80	
7. Pakistan	Small-scale farm machinery/equipment	B,C	1 Agric. Engineer	sp	457,000	Apr.76 Dec.80	Ford Foundation USAID
8. "	Applied research trials	B	(1 Rice Prod. Spec.)+ 1 Rice Prod. Spec.	sp/1	769,000	Jan.77 June 81	USAID loan
9. Sri Lanka	Rice technology improvement and training	B	(1 Plant Breeder, 1 Crop. Syst. Agron)+ 1 Crop Prod. Spec.	sp/1	3,125,000	May 77 Jan.82	USAID loan
19. Thailand	Deepwater rice project	D	1 Plant Breeder	c	166,000	Jan.80 Dec. 80	
10. "	Small-scale machinery project (industrial extension)	B	1 Agric. Engineer	sp	219,000	June 75 Aug.80	USAID
17. "	Liaison	C	1 Plant Br/Res.Admin.	c	68,000	Jan.80 Dec.80	

Table 1 :

IRRI Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
11.	Philippines	Technology transfer (National Food and Agriculture Council,NFAC)	B	1 Crop Prod. Spec.	sp/1	190,000	Sept.78 Aug.81	USAID loan
22.	"	NFAC-National Crop Protection Center operations	E1		sp	57,000	Sept.78 Aug.81	NFAC
23.	"	NFAC-IBRD resettlement project	E1		sp	16,000	May 78 May 80	NFAC
24.	"	Nutritional evaluation laboratory project	E1		sp	327,000	Sept.79 Aug.82	USAID
25.	"	Organizing small farmers for effective use of technology	E1		sp	260,000	July 78 Oct.80	Philippines through PCARR
12.	"	Small-scale machinery project (industrial extension	B, C	1 Agric. Engineer 1/	sp	964,000	June 75 Aug.80	USAID
26.	Korea/ Philippines	Collaborative project on screening for cold tolerance and blast	E1		sp	16,000	1979 to 1980 crop season	Office of Rural Development, Korea

1/ Stationed at IRRI Headquarters.

Table 1 :

IRRI Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
27.	Korea/ Philippines	Collaborative project on gene rotation	E1		sp	54,000	1979 1980 crop season	Office of Rural Development, Korea
18.	South & South-East Asia	Cropping systems outreach	C	1 Crop Syst.Econ. 1/	sp	730,000	Jan,79 Dec.81	IDRC
28.	Indonesia/ Philippines/ Thailand	Project on consequences of mechanization	C, E1	1 Agric. Econ. 1/	sp	654,000	Sept.77 Sept.80	USAID
29.	China/Cuba/ Vietnam	Initiation of collaborative work with scientists in centrally planned economies	C, E1		sp	50,000	July 79 July 80	Ford Found.
31.	Various	Rice germplasm collection	G		c, sp	20,000	Jan.80 Dec.80	IBPGR
30.	USA/ Philippines	Heterotrophic N-fixation	E2		sp	1,237,000	Feb.76 Mar.80	UNDP
14.	Nigeria; IITA	Regional Liaison Africa	C	1 Plant Pathologist/ Res. Admin.	c	126,000	Jan.80 Dec.80	

1/ Stationed at IRRI Headquarters

Table 1 :

IRRI *Off-Campus Activities as of June 1980*

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
15. Colombia; CIAT	Regional Liaison Latin America	C	1 Plant Breeder/ Res. Admin.	c	174,000	Jan.80	Dec.80	
32.	Regional training	II		sp	300,000	Jan.	Dec.80	UNDP

Off-Campus Activities - ICRISAT

A International Testing and Nurseries

1. The crop improvement programmes both at Headquarters and in country-based programmes provide materials for national and regional testing. In general, thus far, yield/adaptation, drought, pest and disease nurseries are provided from ICRISAT Hyderabad. This is an extremely important function as a wide range of germplasm is readily disseminated for use and tested for local adaptation and sources of stable resistances. A large number of scientists collaborate in assembling material for test. The programme is largely funded from core funds.

B, C, D 1/ National, Regional and Core Research Programmes outside the Host Country

2. - 8. 1/ Research and training for the improvement of sorghums and millets.

This activity is the major international off-campus activity of the ICRISAT. It is one which was initiated in 1975 under a 3 year UNDP special project and has continued into a second three year phase - a small number of posts being converted to core programme in 1979 and 1980. The objective of the programme is to breed, for growing in the semi-arid areas of Africa, cultivars of sorghum and millet which have high yields, stability to stress such as insect pests, disease, striga and drought and acceptable quality for local conditions and food preparation. The improvement of the crops is approached using small country-based multidisciplinary teams of from 2 to 10 scientists which make use of locally available and introduced germplasm and ensure incorporation of identified resistance sources from the international testing programmes. This work is often carried out in cooperation with scientists from national programmes. Funding for the project period amounts to US$ 3,180,000 from UNDP (Phase II) and US$ 500,000 from USAID for Mali, US$ 1,052,000 from OAU/SAFGRAD and two projects from IDRC amounting to US$ 697,341. Significant progress has been made in improvement of the two crops from both the breeding and agronomic points of view and it is hoped to continue to develop national, regional and international research aspects of the programme. There is considerable input into national research programmes by way of identification of scientists for training by ICRISAT.

1/ Letters and numbers refer to those in the tabulation.

9. Breeding of High Altitude Sorghum

This is the continuation of a project initiated many years ago under Mexican Government/Rockefeller Foundation programme, continued by IDRC and at the moment funded in an interregnum by ICRISAT. The programme is on the verge of releasing suitable material for use in the high altitude areas of Central America and is well on the way to producing white seeded cold tolerant sorghums. Recent work has also indicated that white seeded cultivars for use at lower elevations may have a potential in drought prone areas and that some lines are suitable for making tortillas. Some cultivars developed have been found to be of value in the high elevation areas of East Africa. Funding is being actively sought to continue the work for a further three years. The project is based at CIMMYT and makes use of facilities at headquarters and at research sites at various altitudes controlled by CIMMYT to advance suitable material.

10. Improvement of Chickpea

ICRISAT has a project based at a sister institute ICARDA which seeks to assist in improving the chickpea crops for the Middle, Near East and Africa. Two scientists are posted at Aleppo, both concerned with aspects of breeding of the crop. The programme receives and exchanges materials from the Indian sub-continent and particularly the ICRISAT core programme and is making significant progress in developing strains resistant to Ascochyta blight a major problem in most countries of the region. Cooperative trials with national programmes are conducted. The project is core funded.

E Collaborative Research Projects

E2 with Developed Countries

11. Centre for Overseas Pest Research, London

COPR and ICRISAT carry out a collaborative research project on the stem borer Chilo partellus. This involves field work at ICRISAT and laboratory studies in London on larval development and the chemical constituents of sorghum. Factors affecting the establishment of larvae and possible chemical antibiosis are being investigated. Local expenses for field work are met by ICRISAT core funds, travel and costs of laboratory studies are met by COPR. All work is "on-campus".

12. Max Plank Institute, Munich

Exploratory work has been carried out on insect attractants. A scheme is in preparation for submission for funding to GTZ which will enable the

chemical nature of plant resistance to insect in legumes to be studied. All work "on-campus".

13. Weed Research Organization, UK

Studies on strigol analogues, which cause germination of the plant parasite, striga have been carried out. Work is effected both on-campus and in Africa. Supplementary studies on striga establishment on sorghum and strain difference in striga have been carried out in UK. The cost of these projects is borne by IDRC and ODA. Sussex University is also involved in the striga analogue work.

14. Reading University, UK

A study on variability of the downy mildew pathogen is in progress, funded by ODA. Oospores are collected on-campus and at ICRISAT cooperating stations and sent to UK for study. Progress has been good. A scientist from UK has visited ICRISAT and was paid for from core funds.

A project in which vegetative material of groundnut is grown in UK after transfer of seed from USA is enabling rapid movement of useful germplasm into our programmes. This is core funded.

A further project on the photoperiod/temperature interaction of chickpeas is carried out in collaboration with the University of Reading. This is funded by ODA as a special project. ICRISAT provides accommodation and facilities for work for overseas scientists.

15. INIA, Mexico

Work has been initiated in collaboration with INIA on the tortilla making properties of sorghums arising from our breeding programme in Mexico. Physical and cooking characteristics are being examined. The Government of Mexico has provided $ 70,000 for this work. Useful results are being obtained.

16. University of Queensland, Australia

There is an important involvement with the University of Queensland on the breeding of short duration photosensitive pigeonpeas. This project is producing valuable results and is funded from the core budget.

17. North Carolina State University, USA

ICRISAT and North Carolina State University have recently initiated a project on biological nitrogen fixation in groundnuts. This is funded

currently by the USDA competitive grant scheme.

F Collection of Information and Data

18. ICRISAT hopes in the near future to mount a project on collection of socio-economic data at village level in West Africa. This is part of the overall programme of the economics programme in Africa which involves assistance to biological scientists in identifying viable technologies and evaluation of information to determine research strategies and consequences. This will be funded on restricted core. Additional information on anthropological aspects will be obtained from a special project supported by IDRC. Data of agroclimatological relevance is being obtained from countries in which ICRISAT works through core funded projects. Data on Niger have already been published and information from Brazil is being assembled so that climatological mapping can commence.

G Germplasm Collection, Maintenance, Preservation and Utilization

19. A representative and diverse germplasm collection is the cornerstone of breeding programmes. ICRISAT has acquired a large collection of germplasm of its five target crops and their wild relatives and is increasing its collection of minor millets. Regular collection trips are being mounted either in cooperation with organizations such as IBPGR, ORSTOM and IRAT or independently by the Centre. The aim is to preserve for posterity in long term storage,as wide a diversity as possible of germplasm which can be made readily available to research workers in national and regional programmes in the SAT. This is necessary since improved cultivars tend to replace old landraces, which contain genes which will be of use in the breeding programmes of the future. Information is recorded both on-campus and in off-campus sites on the characteristics of cultivars and dossiers are being built-up of useful stress resistant characteristics of material. The programme is mainly supported by core budget, but from time to time special project funds are used.

H Training and Follow-up

20. Programmes of "on the spot" training are being developed by ICRISAT scientists posted off-campus. Programmes on sorghum improvement have been conducted in Spanish, by the sorghum breeder at CIMMYT, Mexico, for Latin America. Similar programmes have been conducted for local staff and scientists in Mali in French and courses in Cereal Pathology have been initiated by the Cereal Pathologist based in Upper Volta. Activities are funded from both core and special project funds and a recent innovation has been the inclusion of post doctorate students (International Internship) in a cooperative programme in Africa, funded from core and special projects.

Special efforts are made by ICRISAT outposted staff and by scientists travelling from ICRISAT Center to maintain contacts with former trainees. Many are associated with national research projects and make direct use of information and material obtained from ICRISAT programmes. Training programmes are highly appreciated by students and their Governments and are a vital part of our efforts to strengthen research capability in national programmes.

I Consultations with National Programmes

ICRISAT does not operate a consultancy service per se. From time to time individual staff members have assisted national programmes for short periods in their particular specialist fields, e.g. research station development and research programme planning. Scientists and technicians, in the course of their duties regularly discuss research topics and problems with their colleagues in national programmes. Such interaction is fruitful and furtner strengthened by ICRISAT hosting and cosponsoring conferences, symposia and workshops in areas of ICRISAT's concern either on or "off-campus". ICRISAT scientists frequently attend, by invitation, national and regional research planning meetings, e.g. The All India Coordinated Research Programme meetings on sorghum, millets, pulses and groundnuts and the annual ISRA meetings on sorghum and millet research in Senegal. ICRISAT has been complimented on its participation in the CILSS regional research planning meetings and participates in regional research meetings under the OAU/SAFGRAD/ICRISAT agreements.

There are formal agreements between the Indian Council of Agricultural Research and ICRISAT on research and ICRISAT has "off-campus" activities at five sites in India under these agreements. Annual meetings are held in which ongoing research and results are discussed and future planning effected. Similar meetings are held under the various agreements concluded with national governments for ICRISAT's UNDP funded programme in Africa. Meetings are held at least annually in Senegal and Upper Volta.

Under the contractual terms agreed with UNDP an annual meeting UNDP/CIMMYT/ICRISAT is held in alternative years in Mexico or Hyderabad. In this results of UNDP funded programmes are evaluated and policy decisions on future course of action taken.

Table 2 :

ICRISAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Various	International Trials and Nurseries - Breeding, Entomology, Pathology - all mandate crops	A		c, sp		Continuous	
2. Senegal; Dakar	Project Coordination	B,C	1 Coordinator	sp	Salary + 492,000	Nov.78 Oct.81	IRAT salary + UNDP support
Senegal; Bambey	Research and training for the improvement of sorghums and millets	B,C	1 millet breeder, 1 entomologist	sp	502,000	Nov.78 Oct.81	UNDP
3. Upper Volta; Kamboinse	"	B,C,D	1 team leader/sorghum breeder 1 striga physiologist/ breeder 1 entomologist 2 economists 1 agronomist 1 millet breeder 1 pathologist (1 soil & water engineer) 1/ (1 social anthropologist) 2/ 1 intern	c rc sp	3,597,000	May 78 Dec.82	UNDP, SAFGRAD, IDRC

1/ Funded by SAFGRAD - 2/ Funded by IDRC

Table 2 :

ICRISAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
4. Niger ; Maradi	Research and training for the improvement of sorghums and millets	B,C	1 millet breeder	sp	265,000	Nov.78 Oct.81	UNDP
5. Nigeria; Samaru	"	B,C	1 millet breeder 1 pathologist (1 sorghum breeder) 1/ (1 entomologist) 1/ (1 production agronomist) 1/	sp	1,312,000	May 78 May 82	UNDP SAFGRAD
6. Sudan; Wad Medani	"	B,C	1 millet breeder 1 sorghum breeder	sp	500,000	Nov.78 Oct.81	UNDP
7. Tanzania; Ilonga	"	B,C	1 sorghum breeder	sp	-	Aug.80	USAID/ IITA
8. Mali; Bamako	"	B	1 sorghum/millet breeder 1 agronomist	sp	500,000	June 79 June 81	USAID
9. Mexico; CIMMYT	Breeding High Altitude sorghum	C,D	1 sorghum breeder	c			Sources to be identified

1/ Funded by SAFGRAD.

Table 2 :

ICRISAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
10. Syria; ICARDA	Improvement of chickpea	C,D	1 chickpea breeder 1 geneticist	c	568,000	Jan.79 Dec.82	
11-17. U.K., Germany, Mexico, USA, Australia	Collaborative research	E2		c,sp			ODA, Mexico, COPR, IDRC, USDA
18. West Africa, Brazil	Collection of information and data	F		rc,sp c			IDRC
19.	Germplasm collection, preservation and utilization	G		c, sp			
20. Mali, Upper Volta, Mexico	Training in crop improvement	H	1 plant pathologist 1 breeder 1 agronomist (part-time)	c, sp		short courses	USAID, UNDP

Off-Campus Activities - ICARDA

Cereals

A International Testing

1. The Regional Wheat and Barley Nurseries and data feedback system provide a cooperative testing mechanism for national programmes and ICARDA, as well as a vehicle for dissemination of superior germplasm, allowing useful and adapted materials to become an integral part of the national programmes. For the 79-80 season around 900 nursery sets were distributed to national programmes (mostly in Middle East and North Africa) on specific request. They comprised a yield trial, an observation nursery, a crossing block, early generation segregating materials and a disease screening nursery each for barley, durum and breadwheat. ICARDA scientists visit some of the locations during the crop season. National programmes plant, record and select appropriate materials for further use and provide ICARDA with the field data.

B National Cooperative Projects

2. Jordan

A Ford Foundation grant of US$ 300,000 over a 2 year period has enabled ICARDA to participate in the Cooperative Winter Cereal Research and Demonstration/Production Programme in Jordan. ICARDA has stationed one cereal agronomist there. The purpose of this cooperative programme is to assist the Ministry of Agriculture and Faculty of Agriculture, University of Jordan, to identify higher yielding and better adapted wheat and barley varieties for Jordan, to work out appropriate production technologies and to carry out trials/demonstrations on farmer's fields that will introduce the varieties and technology to the Jordanian farmers in a way and on a scale, they can appreciate and adopt. The project is being extended for another two years.

3. Cyprus

A collaborative project between Agricultural Research Institute (ARI), Cyprus and ICARDA has enabled work on breeding and selection of short duration spring barley and durum wheat for areas with mild winters and short crop growing season, and agronomic aspects for such areas. ICARDA provide a grant of US$ 12,000 per year and no ICARDA staff are station in Cyprus fo this project.

4. Syria

Since 1977 the ICARDA Cereal Improvement Programme and the Syrian National Programme have organized and conducted a series of verification trials on farmer's fields throughout Syria. These trials provide assessment of the yielding ability, stability of performance and disease reactions of most promising lines when cultivated in relatively large plots under field conditions with a suggested package of agronomic practices under various agro-climatic conditions. The project is funded from ICARDA's core budget. One junior scientist and two technicians are assigned for this project.

C Regional Programmes

5. Tunisia

ICARDA has posted one cereal scientist in Tunis to strengthen its research activities in North Africa, particularly Tunisia, Algeria and Morocco. He works closely with the national wheat and barley research workers in these countries in development and identification of varieties with necessary disease resistance and adaptability and pays particular attention to ICARDA's Regional Testing Programme. He has special responsibility to assist and strengthen Tunisian Barley Improvement Programme with special emphasis to drier areas. The project is supported from ICARDA's core budget.

6. Turkey

A collaborative high altitude winter cereal project is being negotiated between ICARDA and the Government of Turkey to improve wheat and barley production of winter habitat including related agronomy, training and communication aspects in the ICARDA region. A scientist has been selected for posting in Ankara. Initially the project is budgeted from ICARDA's core budget.

D Core Research outside Host Country

7. Jordan, Kenya

The Summer Nursery facility at Shawback, Jordan is provided by the Government of Jordan and allows the programme to advance early breeding lines by a generation during the "off season". ICARDA provides operating expenses. Promising advance lines are increased and screened for rust and other foliar diseases at the National Plant Breeding Institute, Njoro, Kenya. This facility is provided by Government of Kenya and CIMMYT.

G Germplasm Collection, Preservation and Utilization

8. ICARDA is developing barley and durum wheat collections, wild species of wheat and barley are being collected from the Middle East. IBPGR has posted a senior scientist who is cooperating in this project.

H Training, Visits and Workshops

ICARDA provides opportunities for young scientists to participate in its six months residential training course, as well as encourages senior scientists and administrators to pay short visits. Periodic workshops and conferences are organized to provide a forum for the exchange of information, research ideas and experiences.

I Consultation to National Programmes

ICARDA scientists, where possible visit the national programmes for consultation with cooperating researchers in the region and also to foster understanding and collaboration between cooperating scientists and create a team spirit in the region.

Food Legumes

The Food Legume Improvement Programme (FLIP) is working on three species; faba beans (Vicia faba), lentils (Lens culinaris) and chickpeas (Cicer arietium); the latter in cooperation with ICRISAT.

A International Testing

9. This is a major activity of FLIP and has the following objectives:

(a) To provide for the widespread dissemination of
- promising elite lines
- materials exhibiting special characteristics for further evaluation testing and hybridization
- early generation segregating populations for development under loca conditions

(b) To allow the multi-location testing of elite material both to reduce the time necessary for evaluation prior to release and to allow the identification of genotypes having wide adaptability.

(c) To provide a mechanism for multi-location testing of materials having disease and pest resistance.

(d) To characterize and group the major environments in which the crops are grown.

(e) To encourage the development of information on agronomic management of these legumes in the region.

In the 1979/80 season 27 different trials were prepared; 10 faba bean, 9 lentil and 8 chickpea. A total of 594 sets of these trials were distributed to 34 different countries.

The trials include materials developed by national programmes, as well as by FLIP. Special trials to evaluate Ascochyta blight resistance (chickpeas and faba beans), Orobanche resistance (faba beans) and winter hardiness (chickpeas) have been developed.

C Regional Programmes

10. The most important off-campus research programme of FLIP is the special project "Applied Research on Faba Beans in the Nile Valley". This is a cooperative project between ICARDA, and the national programmes in Egypt and Sudan. It is funded by International Fund for Agricultural Development, IFAD, and amounts to approximately $ 1,000,000 annually. The project provides funding for the development of staff and research facilities in the national programmes and also aims to create a multi-disciplinary approach to faba bean improvement through the involvement of a large number of national scientists, from various disciplines, in a series of trials conducted on farmers' fields. Although these trials form the focal point of the project, a number of topics have been identified requiring greater in-depth research on the Experiment Stations. Specific research on such topics is contracted with individual scientists. In addition to field trials and surveys, the project aims to strengthen the national programmes through the provision of equipment and other facilities, training (both in-service and higher degree training) and information exchange through meetings, conferences and literature.

A senior ICARDA administrative officer is stationed in Cairo to coordinate the project. The technical and much of the administrative work is handled by national programme scientists in collaboration with ICARDA staff in Cairo, Beirut and Aleppo.

D Core Research Programmes outside the Host Countries

11. Jordan

Summer off-season research work is carried out from June to October at

high altitude research station at Shawbak in Jordan in cooperation with the national research programme of the Jordanian Government, Ministry of Agriculture. The main activities undertaken include generation advance, seed multiplication and some hybridization.

12. Turkey

Research on food legumes under high altitude conditions is being conducted in cooperation with the national programme in Turkey. It is planned to employ a senior scientist to lead this research in the near future.

E Collaborative Research Projects

E1 With developing Countries

13-22. A number of research projects on food legumes have been set up in cooperation with various national programmes in the region. These projects are all funded by IDRC, who make the grants directly to the national programmes. Although no resident expatriate research staff is stationed by ICARDA in the countries concerned, technical input is provided in the origi drafting of the proposals, monitoring the progress of the projects through exchange visits, consultancies, etc., training, and through the provision of germplasm and other genetic materials.

Such cooperative research projects have been established in 9 countrie Algeria, Sudan, Egypt, Lebanon, Syria, Jordan, Turkey, Pakistan and Banglades

The research on chickpeas at ICARDA is a collaborative effort between ICARDA and ICRISAT, with both institutions contributing financially and technically to the research.

E2 With developed Countries

23. A collaborative project on Ascochyta blight resistance in faba beans between ICARDA and the University of Manitoba, Canada is funded by IDRC.

24-25. Two collaborative projects have been established between ICARDA and the Institute for Plant Protection, University of Bonn. One project is on Ascochyta blight in chickpeas and is financed by DAAD 1/. The other project,

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1/ Deutscher Akademischer Austauschdienst

funded by GTZ, is on aphids in Faba beans. Both projects involve research by Ph.D. students at ICARDA, Aleppo. Technical supervision and some back-up research is conducted in Bonn. Collaboration, particularly through the provision of consultants, has also been established between ICARDA and various German institutions, through funding from GTZ in the areas of lentil mechanization, pest surveys and seed production in Egypt.

26. An informal collaborative project on the mineral nutrition of lentil and chickpeas has been established with the University of Hohenheim, West Germany.

27. The FLIP microbiology programme collaborates with the International Atomic Energy Agency (IAEA) programme in its international project on the quantification of symbiotic nitrogen fixation in legumes.

H Training

28. In addition to the two Ph.D. students mentioned under 24-25., there is a collaborative programme with the University of Aleppo through which two students are studying for their MSc degrees at ICARDA. This scheme is sponsored by Ford Foundation. FLIP staff have also been involved with teaching on this MSc course. A third MSc student, registered at Wye College, University of London is also conducting his research at ICARDA, funded by Ford Foundation.

Table 3 :

ICARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
	CEREALS						
1.	Regional Wheat & Barley Testing	A					
2. Jordan	Cooperative Winter Cereal Research & Demonstration/ Production Programme	B	1 Cereal Agronomist	sp	300,000	2 years	Ford Foundation
3. Cyprus	Collaborative Cereal Improvement Programme	B,E1		c	12,000/p.a.		
4. Syria	Farmer's Field Verification Trial	B		c		1977 -	
5. Tunisia	North Africa Research Programme	C,A,B	1 Cereal Scientist	c			
6. Turkey	Collaborative High Altitude Winter Cereal Project	C,D	1 Breeder	c			
7. Jordan; Kenya;	Shawback Summer Nursery Facility Njoro	D					

Table 3 :

ICARDA Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
8.	Syria Lebanon	Germplasm Collection, Preservation & Utilization	G					
	FOOD LEGUMES							
9.		International Testing Programme	A					
10.	Egypt/Sudan	Nile Valley Project Applied Research on Faba Beans	C	1 Admin. Officer	sp	3,000,000	3 years	IFAD
11.	Jordan	Summer Off-season Research (Lentil, Faba Beans)	D		c			
12.	Turkey	High Altitude Food Legume Research (Chickpea, Lentil)	D,C		c			
13.	Algeria	Grain Legume Research	E1,H,I		sp	197,300	3 years	IDRC
14.	Sudan	Food Legume Improvement	E1,H,I		sp	210,200	3 years	IDRC
15.	Egypt	" " "	E1,H,I		sp	243,800	3 years	IDRC

Table 3 :

ICARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
16. Lebanon; Amer.Univ.Beirut	Orobanche Control	E1		sp	106,000	3 years	IDRC
17. Lebanon; Amer.Univ.Beirut	Food from Grains	E1		sp	127,000	3 years	IDRC
18. Syria	Crop Intensification	E1, H,I		sp	242,000	3 years	IDRC
19. Jordan; Univ.of Jordan	Food Legume Improvement (Chickpea, Lentil)	E1		sp			IDRC
20. Turkey	Food Legume Improvement	E1,H,I		sp	255,000	3 years	IDRC
21. Pakistan	" " "	E1,H,I		sp	376,000	3 years	IDRC
22. Bangladesh	" " "	E1,H,I		sp	220,000	3 years	IDRC
23. Canada; Univ. Manitoba	Ascochyta blight in Faba Beans	E2		sp			IDRC
24. Germany; Univ. Bonn	Ascochyta blight in Chickpeas	E2		sp			DAAD

Table 3 :

ICARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
25. Germany; Univ. Bonn	Aphids on Faba Beans	E2		sp			GTZ
26. Germany; Univ. Hohenheim	Mineral Nutrition of Lentil and Chickpea	E2		sp			
27. Austria; IAEA	Nitrogen Fixation by leguminous Crops	E2		sp			
28. Syria; Univ. Aleppo	MSc. Training Food Legumes	H		sp			Ford Foundation

Off-Campus Activities - ILCA

In the case of ILCA, the distinction between on- and off-campus activities is more difficult than in other centres. ILCA's mandate - the study and improvement of livestock production systems in Africa - necessitates a decentralization of its programme according to ecological zones, as these are the main determinants of the production systems. The main field programmes are here described under the heading of regional programmes, although they could well be regarded as on-campus activities.

A International Testing

1. Comparison of Livestock Breeds

Over the years ILCA has assisted national authorities in the analysis of data on the performance of different livestock breeds. Breeds covered include the Maure and Peuhl breeds of the Sahel, and the Sahiwal in Kenya. For 1980 a comparative study on the Boran is planned.

2. Studies on the Use and Potential of Trypanotolerant Breeds

This study is differentiated from A 1. because of its scope, design and detail (involving data collection as well as analysis). After a first phase with FAO and UNEP, which reviewed the state of knowledge on the use and potential of trypanotolerant livestock, ILCA is now establishing a network, which will study the interaction between breed, tsetse challenge and management system, in order to promote a more rational use of the trypanotolerant livestock population of the humid areas. Core budget allocation in 1980 is US$ 171,000 whilst a contribution of US$ 333,000 is expected from the Belgian Government for the Zairian component. Further contributions are envisaged in 1980 in Ivory Coast.

B National Cooperative Projects
(see also E Collaborative Research Projects)

3. Ethiopia

The Government of Ethiopia is contributing in 1980 US$ 60,000 for ILCA's help in the establishment of development monitoring for its Rangeland Development Programme. ILCA is contributing US$ 100,000 from its core funds

for the operating costs.

4. Botswana

Similarly the Government of Botswana is expected to contribute with the operating costs for the establishment of monitoring procedures for its second livestock development project, whilst ILCA will contribute with the secondment to the Botswanan Government of one senior scientist.

5. Kenya

It is expected also that the Kenyan Government will contribute, start-up date uncertain, with US$ 100,000 for monitoring in its second livestock development project.

The above activities can also be classified, with 11. below, as monitoring.

6. Mali

The Belgian Government has expressed interest in funding the special project which would expand ILCA's research in the sedentary millet-livestock system. Provisionally US$ 152,000 is allocated to this special project in 1980.

C, D Regional Programmes and Core Research outside Host Country

As mentioned before, ILCA's main research thrust is on regional programmes differentiated according to ecological zones. They are all funded from the core budget and are as follows:

7. Arid Zones Research

A total of US$ 798,000 and 6.5 senior scientific man-years are allocated in 1980 to ILCA's Arid Zones Research in Mali. The main lines of research are (a) the improvement of fodder production and its quality in the sedentary production systems, and (b) the development of socio and territorial units, and the improvement of livestock nutrition in the framework of such units, in migratory systems.

8. Subhumid Zones Research

US$ 642,000 and 5.6 senior man-years are allocated in 1980 to ILCA's research in the subhumid zone, which is centred around Kaduna in Nigeria. Its main focus is on the improvement of dry season quality of livestock nutrition in the sedentarized Fulani system.

9. Humid Zones Research

Around Ibadan, Nigeria, ILCA's Humid Zones Research team (allocated US$ 657,000 and 5.5 senior man-years in 1980) is developing small ruminant production systems for village conditions. The utilization of exisiting fallow land stands central in the approach, whereby improved productivity is sought through alleviating disease and nutritional constraints.

10. Highlands Research

Although physically located in the host country, ILCA's Highland Research falls in the same category of Regional Programmes. Its main aim is a better integration of livstock and cropping in small holder subsistence systems. This is being obtained through the introduction of forages in the cropping systems and the genetic improvement of cattle for milk production and traction. US$ 704,000 and 6.5 man-years of senior scientific staff have been allocated to this component of ILCA's field research in 1980.

11. Studies in Livestock Development Schemes

ILCA has a central team located in Kenya developing a methodology which will assist in the determination of the factors which affect livesto development schemes. As this methodology has regional relevance, it is classified in this category. US$ 549,000 and 4.1 man-years are allocated in 1980 to this activity.

E Collaborative Research Projects

E1 With Developing Countries

12. Mali

Negotiations with the Malian Government are almost concluded for the application of ILCA's methodology in the definition of social territoria limits in the Inner Delta of the Niger. The Malian Government will contribute to ILCA for this special project US$ 600,000 over a two-year period starting in October 1980.

13. Africa

IDRC is contributing to a documentation team which collects non-conventional literature on livestock production at African libraries and research institutes. Countries covered in 1980 under this special project

are Nigeria, Cameroon, Tanzania and Ethiopia. IDRC's contribution is US$ 64,000 in 1980.

E2 With Developed Countries

14. ILCA cooperates with the University of Hohenheim, West Germany, in the development of a farm planning model for the small-holders system in its highland research. ILCA has allocated US$ 20,000 core funds, whereas the contribution of the University is valued at approximately the same level.

15. A similar cooperation exists between the National Institute of Agricultural Engineering of the U.K. in the field of animal traction in ILCA's highland research.

H Training

The non-availability of training facilities has constrained ILCA's training activities in the past. Nevertheless a total of 10 fellows are presently working in ILCA's field research programme, and it is expected that next year approximately 70 African scientists and development personnel will undergo formal training at ILCA.

I Consultation to National Programmes

Apart from its active cooperation with national programmes in its livestock development monitoring activities (see 3., 4. and 5.) ILCA has no formal agreements with governments for consultations. However, if possible within their work plan, it encourages scientists to participate in consultancy missions of international technical assistance organizations, as it sees those consultations as an effective way to extend its research and development methodologies.

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
1. Africa	Comparison Livestock Breeds	A	Animal Geneticist	c	82,000			
2. W.Africa (Zaire and Ivory Coast)	Trypanotolerance Network	A	1 Animal Scientist 1 Economist	c,sp	504,000	Oct.80	Oct.83	Belgium
3. Ethiopia	Livestock Project Monitoring	B	1 Socio-Economist	c,sp	160,000	Apr.80	Apr.83	Ethiopia
4. Botswana	" " "	B	1 Economist	c,sp	153,000	Jul.80	Jul.83	Botswana
5. Kenya	" " "	B	-	sp	100,000	Oct.80		Kenya
6. Mali; Niono	Forage Introduction Sedentary Millet System	B	1 Agronomist 1 Animal Nutritionist	sp	152,000	Oct.80		Belgium
7. Mali; Niono	Arid Zones Research	C,D	2 Agronomists 2 Animal Scientists 1 Socio-Economist 1 Ecologist 1 Animal Nutritionist	c	789,000			
8. Nigeria; Kaduna	Subhumid Zones Research	C,D	1 Economist 1 Ecologist 2 Animal Scientists 1 Sociologist 1 Animal Nutritionist	c	642,000			

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
9. Nigeria; Ibadan	Humid Zones Research	C,D	1 Veterinarian 1 Animal Scientist 1 Animal Nutritionist 1 Forage Agronomist 2 Veterinarians 1 Economist	c	657,000			
10. Ethiopia; Debre Zeit and Debre Berhan	Highlands Research	C	2 Animal Scientists 1 Forage Agronomist 1 Economist 3 Farm Management Spec.	c	704,000			
11. Kenya	Studies Development Schemes	C,D	2 Animal Scientists 2 Ecologists 1 Economist 1 Sociologist	c	549,000			
12. Mali	Application Social Territorial Organization	E1	1 Ecologist 2 Sociologists 1 Animal Scientist 1 Geographer	sp	600,000 (2 years)	Oct.80	Oct.82	Mali/IDA

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
13. Africa	Documentation Collection	E1		sp	64,000	Apr.79	Apr.81	IDRC
14. West Germany; Univ. Hohenheim	Farm Planning Model	E2		c	20,000	May 79	May 81	
15. United Kingdom; NIAE	Animal Traction	E2		c,sp	10,000			NIAE

Off-Campus Activities - IITA

A International Testing

1. IITA has an established international testing programme for cowpeas. In 1979, 189 trial sets were sent to 48 countries. Included in this programme are yield trials, disease resistance nurseries and intercropping trials. Within Africa, IITA promotes regional maize and cowpea trials through its involvement in the SAFGRAD Project (see 11 below) and a number of African countries are participating in sweet potato and cassava testing programmes.

B National Cooperative Projects

2. Sierra Leone

Since 1974, IITA has been under subcontract with FAO to execute a UNDP funded project aimed at strengthening rice research in Sierra Leone. Under the present phase of the subcontract which expires 31 December 1980, IITA has had a team of three scientists; a pathologist, an agronomist, and an extension agronomist, undertaking a number of agronomic experiments, performing a series of studies of rice disease problems and executing a programme of on farm trials of improved packages of rice technology.

3. Ghana

In June 1979, IITA entered into a contract with USAID calling for IITA to place two scientists at Atebubu in Central Ghana to undertake studies aimed at improving food crop farming systems in the region. The two scientists are an agronomist and a land management systems agronomist.

4. Upper Volta

A grant from IDRC has enabled IITA to place since 1977, a plant breeder in Ouagadougou to assist the Government of Upper Volta develop its National Cowpea Improvement Program.

5. Nigeria

IITA has been participating in the National Accelerated Food Production Project (NAFPP) since 1974, first under a grant from USAID and since July 1977 under a grant from the Nigerian Government. Under the Nigerian Government grant, eight IITA scientists were involved in supporting various aspects of the NAFPP. At the present time (August 1980), one IITA staff member, a communications specialist, remains and will serve under NAFPP till 31 December 1980.

6. Cameroon

IITA is involved in two projects in Cameroon, the Cameroon National Root Crops Improvement Program (CNRCIP) and the ZAPI-Est Farming Systems Research Project. Funds from the Belgian Government and the IDRC enable IITA to provide two agricultural advisers, a plant breeder and an agronomist, to the CNRCIP which focuses on cassava, sweet potato, yam and cocoyam improvement. An IITA agronomist is stationed in Easter Cameroon under the IBRD funded ZAPI-Est Project to develop over a three year period a long term plan for food crops research in the area.

IITA is presently negotiating its participation under a grant from USAID in the Cameroon National Cereals Research and Extension (NCRE) Project. NCRE would cover maize, rice, sorghum and millet. IITA would seek ICRISAT's participation in the sorghum and millet aspects of NCRE.

7. Zaire

Since 1974, IITA has been assisting the Government of Zaire develop its national cassava programme, Programme National Manioc (PRONAM), first under a contract with the Zairian Government and since May 1980 under a contract with USAID. With USAID support IITA is to provide a team of eight; an agronomist, a plant breeder, an entomologist, two extension agronomists, a training officer, a physical plant services officer and an administrator.

8. Tanzania

IITA and, through subcontractual arrangements, CIMMYT and ICRISAT are involved in strengthening food crops research in Tanzania. IITA is providing a project leader, an agricultural economist and a team consisting of a plant breeder and an agronomist to work on grain legumes. CIMMYT is providing a plant breeder and an agronomist for maize improvement and ICRISAT is providing a plant breeder to work on sorghum.

9. Sao Tome

IITA is assisting the Republic of Sao Tome and Principe (RSTP) establis a national food crop trials programme involving rice, maize and grain legumes. IITA does not have a full time scientist assigned to RSTP, rather two Sao Tomeans have received concentrated training in establishing and evaluating food crop trials and IITA scientists make several trips per year to Sao Tome to guide and evaluate the effort which is funded under a contract with USAID.

10 Sri Lanka

An IITA agricultural engineer is assigned to Sri Lanka to develop an agricultural engineering programme focussed on developing small tools and machinery for low resource food crop farmers in the tropics. Although part

of a national effort, tools and machinery developed would be relevant to food crop farming systems throughout the tropics.

C Regional Programmes

11. SAFGRAD

Under a contract with USAID, IITA is providing four scientists to participate in the Semi-Arid Food Grains Research and Development (SAFGRAD) Project. The scientists, all based in Ouagadougou, are a maize breeder, a maize agronomist, a cowpea agronomist and an entomologist. The cowpea agronomist works closely with the IITA cowpea breeder assigned to the Upper Volta National Cowpea Improvement Programme. There are twenty-four African countries participating in the SAFGRAD effort.

D Core Research Programmes Outside the Host Country

12. Brazil

An IITA plant breeder has been assigned to assist the Brazilian Government develop a national cowpea improvement programme. This scientist has been assigned to the Empresa Brasileira de Pesguisa Agropecuaria (EMBRAPA) agricultural research station at Goiânia. The rationale for locating this core activity in Brazil stems from the fact that outside Nigeria, Brazil is the world's largest producer of cowpeas, one of the crops for which IITA has a world wide mandate.

E Collaborative Research Projects

E1 With Developing Countries

13. Niger

Under a grant from IDRC, IITA is undertaking in collaboration with the Institut National de Recherches Agronomiques (INRAN) of Niger a study of drought tolerance in cowpea. A core supported IITA post-doctoral fellow is assigned to this study.

14. Brazil

IITA has entered into an agreement with EMBRAPA whereby the two institutes collaborate on land development and soil management research, EMBRAPA is responsible for covering costs which can be paid in Brazilian currency, IITA covers other costs from its core budget. No full time IITA scientist is assigned to this project.

15. Kenya

IITA and the International Centre on Insect Physiology and Ecology (ICIPE) in Kenya are collaborating on research into a major insect pest of cowpea, Maruca testulatis. IITA is supporting this collaboration, which does not involve a full time staff position, with its core funds.

16. Ghana

IITA is collaborating with scientists of the Ghanaian Grains Development Board and the resident CIMMYT maize scientist on a programme of cowpea improvement research. No full time IITA scientist is assigned to this effort which is funded under a grant from the Canadian Government to CIMMYT.

E2 With Developed Countries

17. USA: The Boyce Thompson Institute (BTI) and Cornell University

A grant from UNDP supports collaboration between IITA, BTI and Cornell University scientists working on nitrogen fixation in cowpea and soybean. This collaboration does not involve the assignment of IITA scientists to off-campus locations.

18. Australia: The University of Western Australia

Funds provided to IITA by UNDP for studies of nitrogen fixation enable IITA to support a postdoctoral fellow at the University of Western Australia investigating nodulated cowpea lines for variation in post anthesis performance.

19. Netherlands

IITA has entered into an agreement with Dutch Research Institute for Plant Protection whereby the two Institutes collaborate on research into virus diseases of tropical food crops. IITA is supporting this collaboration with core funds.

20. Belgium

With support from the AGCD of Belgium, IITA has entered into agreements for collaborative research with the following Belgian universities for the areas indicated:

Gembloux	Grain legume research
Louvain	Cassava disease studies
Gent	Pedology
Leuven	Plantain research

G Germplasm Collection, Preservation and Utilization

21. The collection and evaluation of rice, food legumes and root crop germplasm are the major objectives of IITA's Genetic Resources Unit (GRU). Material from these collections are made available to collaborating scientists, to national programmes and to genetic resource centres of other agricultural research institutes. The GRU is largely supported from core fund; however, special grants have been made available by the International Board for Plant Genetic Resources for certain facilities and for training Africans in genetic resources conservation.

H Training and Follow-up

22. Research Fellows (Ph.D. level), Research Scholars (M.Sc. level), Vacation Student Research Scholars (final year undergraduates) and participants in the seven to ten courses offered at IITA every year number around 300. Seventy of these are registered for graduate degrees in 15 universities of seven countries of three continents. Approximately 20 are registered at the neighbouring University of Ibadan. Vacation Student Research Scholars number as many as 20 every year. The rest are participants of group courses of varying lengths covering the areas for which IITA's mandate has made it responsible among the International Agricultural Research Centres, including soil and plant analysis, soil microbiology, soil and water conservation research, genetic resources conservation, post harvest engineering, and grain legumes, root crops and maize and rice production courses. Most courses are conducted in both English and French.

Current addresses are kept for all of IITA's Training alumni, who receive the IITA Newsletter and various publications. Continuing contact is maintained not only through the printed word but also through visits arranged during staff travel and during conferences and workshops.

I Consultation with National Programmes

23. IITA carries on continuing consultations with national agricultural research programmes and often sends scientists to visit such programmes. In addition, IITA often invites scientists from national programmes to visit IITA's headquarters site and to participate in the numerous conferences and workshops hosted by the Institute. As is consistent with IITA's mandate, the focus of these consultation visits is on African national programmes.

Table 5 :

IITA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
1.	International Testing	A		c				
2. Sierra Leone	Rice Research, technology transfer (t.t.)	B	1 Pathologist 1 Agronomist + (1 Extension Agron.)	sp	646,000	1.1.78	31.12.80	UNDP/FAO
3. Ghana	Farming Systems Research t.t.	B	1 Agronomist 1 Land Man. Syst.Agron.	sp	906,000	25.6.79	31.12.82	USAID
4. Upper Volta	Cowpea research, t.t.	B	1 Breeder	sp	340,000	25.8.77	31. 5.81	IDRC
5. Nigeria	Strengthen national programme	B	1 Communic. Spec.	sp	1,317,000	1.7.77	31.12.80	Nigeria
6. Cameroon	Root crops research, t.t.	B	1 Breeder	sp	410,000	1.4.77	30. 9.83	IDRC
			1 Agronomist		750,000	1.10.77	30. 9.82	Belgium
"	Farming systems research,t.t.	B	1 Agronomist	sp	402,000	1.9.78	30. 6.83	World Bank
7. Zaire	Cassava research, t.t.	B	1 Agronomist 1 Breeder 1 Entomologist + (2 Exten. Agron. 1 Training Off. 1 Phys.Plant Serv. Off. 1 Admin Off.)	sp	3,113,000	1.5.80	30. 4.84	USAID

Table 5 :

IITA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
8. Tanzania	Maize, grain legume, sorghum research, t.t.	B	1 Project Leader 1 Agric. Econ. 1 Breeder 1 Agronomist	sp	3,010,000	1.11.76	30. 9.80	USAID
9. Sao Tome	Technology transfer	B		sp	43,000	8. 5.78	7.11.80	USAID
10. Sri Lanka	Agric. engineering research, t.t.	B,C	1 Agric. Engin.	sp	475,000	7.12.79	6.12.82	Ciba Geigy
11. SAFGRAD	Maize, cowpea research,t.t.	C	1 Breeder 2 Agronomists 1 Entomologist	sp	1,326,000	8. 3.78	7. 3.81	USAID
12. Brazil	Cowpea research, t.t.	D	1 Breeder	c				
13. Niger	Cowpea drought tolerance research	E1	1 Post. Doc.	sp, c	52,000	5. 2.80	4. 2.82	IDRC
14. Brazil	Land preparation, soil management research	E1		c				
15. Kenya	Cowpea insect pest research	E1		c				
16. Ghana	Cowpea research, t.t.	E1		sp	60,000	10.11.77	9.11.83	CIDA/CIMMYT

Table 5 :

IITA Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
17.	USA; BTI & Cornell	Grain legume nitrogen fixation research	E2		sp	880,00	7. 2.69 6. 2.84	UNDP
18.	Australia; Univ. W.Aust.	Grain legume nitrogen fixation research	E2		sp	56,000	1. 2.80 31. 1.82	UNDP
19.	Netherlands	Virus disease research	E2		c			
20.	Belgium	Collaborative research	E2		sp	240,000	annual grant	Belgium
21.		Germplasm activities	G		c			
22.		Training and follow-up	H		c			
23.		Consultations to national programmes	I		c			

Off-Campus Activities - WARDA

WARDA is an Association of 15 countries in West Africa with the mandate to promote steps for increasing the quantity and improving the quality of rice produced locally. As such, a substantial part of WARDA's activities is located off-campus and distributed so as to cater for geographical as well as ecological coverage.

A International Testing

1. This is the most extensive of WARDA's off-campus activities. In 1980, as for past years, some 225 sets of seeds and chemicals have been distributed to some 61 sites throughout the region. These include three types of initial evaluation tests based on ecology; 12 types of coordinated variety trials based on ecology and duration; and two types of crop protection trials based on ecology. The varietal testing programmes include materials introduced from IRRI, IITA, CIAT, IRAT and national programmes in Asia, South America and West Africa. The main purpose of these tests is to identify varieties which are well adapted to the different ecologies that exist in the region. National programmes also gain access to excellent breeding materials from these tests. Direct cost of these trials in 1980 is estimated at US$ 197,000 and is funded from core budget. Supervision and surveillance of these trials is done by WARDA's Sub-Regional Coordinators.

B National Cooperative Projects

WARDA's activities in this area consist of core funded support of national research capabilities. These activities include direct technical support, backstopping consultations and visits by the Sub-Regional Coordinators, staff of Special Research Projects as well as technical staff from headquarters. Although these are regular activities involving all technical staff of the association they are not specified under any particular budget item.

C Regional Programmes

WARDA has posted a Sub-Regional Coordinator and an Assistant to a central location in each of its five sub-regions as follows:

2. Gambia, Senegal, Guinea Bissau and Mauritania; stationed in Gambia.

3. Guinea, Sierra Leone and Liberia; stationed in Guinea.

4. Upper Volta, Ivory Coast and Mali; stationed in Upper Volta.

5. Ghana and Nigeria; stationed in Ghana.

6. Niger, Togo and Benin; stationed in Niger.

Geographic, as well as linguistic considerations were determining factors in these groupings so as to facilitate communication and easy operations. The duties of these Sub-Regional Coordinators include supervision and surveillance of WARDA's network of trials. They maintain close contacts with Governments and rice scientists in their respecitve countries of operation and effect liaison between national programmes and WARDA's special Research Projects, as well as staff at headquarters. They are supported from core budget. Total budget for these operations in 1980 amount to US$ 678,000.

D Core Research Programmes outside the Host Country

WARDA's special research projects for irrigated, rainfed, deep flooded/floating and mangrove rice are ecologically placed. They are usually located side by side with the strongest national programme in that ecology. These locations also turn out to be where the particular type of rice cultivation is of major importance. These special research projects are distributed as follows:

7. Special Research Project for irrigated rice; located at Richard-Toll/Fanaye, Senegal and funded by IDRC and Belgium. Total budget for 1980 is US$ 186,000.

8. Special Research Project for mangrove rice; located at Rokupr, Sierra Leone and funded by USAID and ODA. Total budget for 1980 is US$ 495,500.

9. Special Research Project for upland rice; located at Bouake, Ivory Coast and supported by France, which is providing US$ 120,000 in 1980 for the project. Because of the importance of rainfed rice in the region, this project needs much expansion. A comprehensive five year plan for this project requires $ 2,379,130, $ 1,703,030, $ 1,681,425, $ 1,176,050 and $ 975,035 for 1980 through 1984 respectively. Funds are being sought from bilateral sources.

10. Special Research Project for deep flooded and floating rice; located at Mopti, Mali and funded by USAID. Total budget for 1980 is US$ 298,900.

E Collaborative Research Projects

E2 With Developed Countries/Institutions

11. Catholic University Louvain-la-Neuve, Belgium

Under a Government of Belgium grant averaging about US$ 120,000 per annum (1980-84), WARDA scientists in Senegal, Sierra Leone and Liberia in collaboration with staff of the Catholic University in Belgium have embarked on research on azolla and its use in lowland rice culture in West Africa. One WARDA staff is situated in Richard Toll, Senegal following intensive training in Belgium and is responsible for coordinating such research throughout the region.

12. ICIPE

WARDA is yet to initiate its part of an ICIPE/WARDA cooperative programme on lepidopterous rice stemborers. WARDA's part in the programme has been budgetted as $ 161,350, $122,350 and $105,350 respectively for 1980, 1981 and 1982. Work will start as soon as donor support is available; it is expected that EEC may accept to fund this project.

F Collection of Information and Data

13. WARDA engages in collaborative on-farm research with scientists in all member countries except Nigeria. The main idea is to identify constraints to production and collection of base line data and information so as to evolve means of bridging the gap between research results and production levels. A large part of this research is done through on-farm trials which also serve in assessment of performance. These programmes are coordinated by the Sub-Regional Coordinators. Total budget for these trials is US$ 75,000 in 1980 and is core funded.

14. WARDA conducts disease and pest monitoring tours in the region. Institutions such as IRRI, IITA and IRAT as well as national scientists have contributed to these tours and costs to WARDA have been negligible.

G Germplasm Collection, Preservation and Utilization

15. WARDA collaborates with IITA and IRAT-ORSTOM in this activity. WARDA's planned activities for 1980 cost $ 45,000.

I Consultation to National Programmes

WARDA has no formal, scheduled programme of consultation to national programmes. However, its scientists maintain contact with national programmes through frequent visits and correspondence.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
1. West Africa	International Rice Testing Program	A		c	197,000 p.a.		
2. Gambia	Sub-Regional Coordination - Gambia, Senegal, Guinea Bissau, Mauritania	C	1 Agronomist 1 Asst. Agron.	c	678,000 p.a.		
3. Guinea	Sub-Regional Coordination - Guinea, Sierra Leone, Liberia	C	(1 Agronomist) 1 Asst. Agron.	c			
4. Upper Volta	Sub-Regional Coordination - Upper Volta, Mali, Ivory Coast	C	1 Agronomist 1 Asst. Agron.	c			
5. Ghana	Sub-Regional Coordination - Ghana, Nigeria	C	1 Agronomist 1 Asst. Agron.	c			
6. Niger	Sub-Regional Coordination - Niger, Togo, Benin	C	1 Agronomist 1 Asst. Agron.	c			
7. Senegal; Richard Toll/ Fanaye	Research Project - Irrigated Rice	D,C	1 Soil Scientist/ /Team leader + (1 Breeder 1 Entomologist 1 Weed Sc. 1 Agronomist)	c,sp	186,000 p.a.		IDRC, CIDA Belgium

1/Staff in parenthesis not yet in position.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff [1/]	Funding			Donors
				Type	Amount $	Duration From To	
8. Sierra Leone; Rokupr	Research Project - Mangrove Rice	D, C	1 Breeder 1 Soil Scientist 1 Entomologist + (1 Pathologist, 1 Weed Sc., 1 Agronomist)	c, sp	495,500 p.a.		USAID, ODA
9. Ivory Coast; Bouaké	Research Project - Upland Rice	D, C	1 Asst. Breeder + (1 Team Leader, 1 Breeder 1 Pathologist, 1 Entomologist 1 Climatologist 1 Soil Scient. 1 Weed Scient. 1 Agronomist)	c, sp	120,000 [2/] p.a.		France
10. Mali; Mopti	Research Project - Deep Flooded and Floating Rice	D, C	1 Agronomist + (1 Breeder 1 Weed Scient. 1 Entomologist 1 Team Leader)	c, sp	299,000 p.a.		USAID

1/ Staff in parenthesis not yet in position - 2/ Subject to change.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
11. West Africa/ Belgium	Collaborative Research on Azolla and its use in Lowland Rice	E2		sp	120,000 p.a.		Belgium
12. West Africa/ ICIPE	Collaborative Research on Lepidopterous Rice Stem Borers with ICIPE	E2		sp	3/		EEC (?)
13. West Africa	On-Farm Research	F, E1		c	75,000 p.a.		
14. West Africa	Disease and Pest Monitoring	F		c			
15. West Africa	Germplasm Collection, Preservation and Utilization	G		c	45,000 p.a.		

1/ Staff in parenthesis not yet in position.

2/ Funds not available yet.

Off-Campus Activities - IBPGR

B National Programmes

1. The IBPGR has continued to help to build up national programmes in countries where important genetic diversity exists.

C Regional Programmes

The major regional efforts supported by the Board are:

2. Southeast Asia

The countries in Southeast Asia (Indonesia, Malaysia, Papua New Guinea, the Philippines and Thailand) established a regional cooperative programme for genetic resources activities in 1976. A regional genetic resources officer was appointed in mid-1979 stationed in Bangkok.

3. Mediterranean

Since 1980, the Germplasm Laboratory of the Italian National Research Council at Bari, Italy, has been coordinating the collection and conservatio of germplasm in the Mediterranean countries.

4. Southwest Asia

To implement the IBPGR programme in the countries of Southwest Asian region, an officer has been posted to ICARDA headquarters at Aleppo, Syria. This officer will also act as a catalyst for the emerging ICARDA genetic resources programme.

E Collaborative Research Projects

E2 With Developed Countries

5. The University of Reading, UK

The Board is supporting research work on seed physiology related to storage conditions.

6. CSIRO, Canberra, Australia

Studies on long-term storage of grapes in vitro ($21,063).

7. The Royal Tropical Institute, Amsterdam, The Netherlands

Studies on genetic resources of tropical and sub-tropical fruits and nuts ($74,460).

G Germplasm Collection, Preservation and Utilization

8. Latin America

Collection of Arachis germplasm in South America. Brazil, Argentina, Peru and Bolivia - ongoing since 1976.

9. Uruguay

Collection of forage grasses and legumes germplasm - ongoing since 1978 ($25,000).

10. Brazil

Collection of maize germplasm in the Amazon region (CENARGEN/EMBRAPA). Maintenance of living collection of Arachis sp.

11. Colombia (CIAT)

Coordination of Phaseolus germplasm collection in Latin America.

12. Peru

Collection of maize germplasm in the Selva region and Lycopersicon in the Marañon Valley. Evaluation of maize germplasm.

13. Bolivia

Improvement of seed storage facilities at La Paz.

14. Paraguay

Collection of maize germplasm.

15. Chile

Collection of maize germplasm

16. Philippines

Collection of indigenous rice germplasm in South and Southeast Asian countries (IRRI). Ongoing since 1978. Maintenance of Southeast Asian banana germplasm - ongoing since 1978. Establishment of coconut genetic resources centre. Collection of fruit tree germplasm.

17. Malaysia

Collection and evaluation of banana germplasm by PCARR.

18. Indonesia

Exploration of banana germplasm in Sumatra and Eastern Indonesia. Collection of coconut germplasm.

19. Papua New Guinea

Collection of leafy vegetables and yams germplasm in Sepik and Madang provinces.

20. Thailand

Collection of Amaranth germplasm, Momordica sp. and rice germplasm. Seed storage facilities for conservation of germplasm.

21. East Africa (ICRISAT)

Collection of sorghum and millet germplasm.

22. Sudan

Collection of wheat germplasm in Jebel Marra.

23. Cyprus

Collection of Vicia faba germplasm.

24. Portugal and Spain

Collection of Secale and Lupinus germplasm.

25. Israel

Collection of lentils germplasm in South Europe.

26. Greece

Seed storage facilities for conservation of genetic resources.

27. Bangladesh

Collection of food legume germplasm.

28. Japan

Multiplication and distribution of genetic stocks of Triticum and Aegilops sp.

H Training and Follow-up

29. International post-graduate training on conservation and utilization of genetic resources at the University of Birmingham, UK, to enable additional students from developing countries to be trained.

30. Syria

Training Course on the collection, maintenance and utilization of wheat and barley germplasm for participants from the Mediterranean, South-west Asia and the South Asian countries.

31. Thailand

Training course on the collection and conservation of perennial crops - 30 June to 25 July 1980.

32. Argentina

Training course on collecting techniques - 14 April to 10 May 1980.

33. Nigeria (IITA)

Training course on Crop Genetic Resources Conservation - February/ March 1980.

Table 7 :

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From	To
1. Worldwide	Building up of national programmes	B, G				1974	
2. Thailand	Southeast Asia Regional Cooperative Programme	C, G, B	1 Germplasm Sc.	c	19,000 p.a.	1976	
3. Italy	Germplasm work in Mediterranean Region	C, G, B		c	190,000 p.a.	1976	
4. Syria (ICARDA)	Germplasm work in Southwest Asian Region	C, G, B	1 Germplasm Sc.	c	300,000 p.a.	1976	
5. U.K.; University Reading	Investigations on seed longevity	E2		c	50,000-75,000 p.a.	1978	
6. Australia; CSIRO	Long-term storage of grapes in vitro	E2		c	21,063	1980	
7. Netherlands; Royal Tropical Institute	Genetic resources of tropical and sub-tropical fruits and nuts	E2		c	74,460	1980	
8. Latin America; Brazil, Argentina,	Collection of Arachis germplasm	G		c	106,000 for 4 yrs.	1976	

Table

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
9. Uruguay	Collection of forage germplasm	G		c	25,000	1978	
10. Brazil; CENARGEN/ EMBRAPA	Collection of maize germplasm	G		c	25,000	1979	
Brazil	Maintenance of Arachis living collection	C		c	25,000	1980	
11. Colombia (CIAT)	Phaseolus collection in Latin America	G, C		c	61,000	1978	
12. Peru	Collection of maize germplasm	G		c	23,000	1979	
"	Collection of Lycopersicon germplasm	G		c	14,000	1980	
"	Evaluation of maize germplasm	G		c	43,000 for 2 yrs.	1980	
13. Bolivia; La Paz	Improvement of seed storage facilities	G		c	5,000	1979	
14. Paraguay	Collection of maize germplasm	G		c	17,000	1979	
15. Chile	Collection of maize germplasm	G		c	21,000	1980	

Table 7:

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From	To
16. Philippines	Collection of rice germplasm in South and Southeast Asia (IRRI)	G,C		c	40,000	1978	
"	Maintenance of banana collection in Southeast Asia	G,C		c	31,000	1978	
"	Establishment of coconut genetic resources centre	G					
"	Collection of fruit tree germplasm	G		c	10,000	1980	
17. Malaysia; PCARR	Collection of banana germplasm	G		c	10,000	1979	
18. Indonesia	Exploration of banana germplasm	G		c	10,000	1979	
"	Collection of coconut germplasm	G		c	13,500	1979	
19. Papua New Guinea	Collection of vegetables and yams germplasm	G		c	5,500	1980	
20. Thailand	Collection of Amaranth germplasm	G		c	10,000	1980	

Table 7 :

IBPGR Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From	To
	Thailand	Collection of Mormodica sp. and upland rice germplasm	G		c	5,000	1980	
	"	Seed storage facilities	G		c	40,000	1980	
21.	East Africa (ICRISAT)	Collection of sorghum and millet germplasm	G		c	12,000	1979	
22.	Sudan; Jebel Marra	Collection of wheat germplasm	G		c	7,500	1980	
23.	Cyprus	Collection of Vicia faba germplasm	G		c	5,000	1980	
24.	Portugal & Spain	Collection of Secale and Lupinus germplasm	G		c	17,000	1980	
25.	Israel	Collection of lentils germplasm	G		c	3,000	1980	
26.	Greece	Seed storage facilities	G		c	40,000	1980	
27.	Bangladesh	Collection of food legumes germplasm	G		c	7,500	1979	
28.	Japan	Multiplication and distribution of genetic stocks of Triticum and Aegilops sp.	G		c	10,000	1979	

Table 7 :

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
30. U.K.; Univ. of Birmingham	Post-graduate training at the University of Birmingham	H		c	25,000-50,000 p.a.	1975	Partially UNEP
31. Syria (ICARDA)	Training on collection, maintenance & utilization of wheat and barley germplasm	H		c	35,000	1980	
32. Thailand	Training on collection and conservation of perennial crops	H		c	28,000	1980	
33. Argentina	Training on collection techniques	H		c	27,000	1980	
34. Nigeria (IITA)	Training on crop genetic resources conservation	H		c	25,000	1980	

Off-Campus Activities - IFPRI

E Collaborative Research Projects

E1 With Developing Countries

1. ASEAN Countries (Indonesia, Malaysia, the Philippines, Thailand) Rice Policy Research Project

The Rice Policy Research Project is a joint IFPRI, IFDC, IRRI effort to understand the various facets of government policies that impinge on rice, the most important commodity in the four Southeast Asian countries (Indonesia, Malaysia, the Philippines and Thailand), which form (with Singapore) the Association of Southeast Asian Nations (ASEAN).

IFPRI is allocating 2.75 senior staff person years of core budget support to this research effort in 1980 and 3.25 in 1981 in support of core research activities under the project and activities involved in project development. An IFPRI staff member is based at IRRI as field coordinator.

Collaborative linkages have been established with individuals and institutions in the four countries: Indonesia, Malaysia, the Philippines, and Thailand. Papers and studies have been and are being commissioned for work in connection with this project.

In addition the project provides for an annual workshop to be held in one of the project countries to discuss the progress of the research project.

IFPRI is seeking funding for the country level work under the project. The UNDP has provided support for the regional workshops.

2. Bangladesh Food for Work Project

The objective of this project is to do an in-depth evaluation of the Bangladesh Food-for-Work Programme. Plans are for the study to be undertaken jointly by IFPRI staff and the Bangladesh Institute of Development (BIDS) with funding from a consortium of organizations including: The World Food Program, CIDA, the Ford Foundation and the World Bank. IFPRI's contribution will be in the form of core staff input into the project. With the exception of the study activities carried out at IFPRI by IFPRI researchers, the project will be based in Bangladesh.

IFPRI will provide one core-budget person year of researcher time and related support services in 1980 and 1.75 person years in 1981 as follows:

- Project Coordinator and senior analyst on the budgetary value of an externally subsidized food-for-work programme;
- Senior Analyst on its short-term welfare benefits;
- Senior analyst on its development aspect. The work on this project also relates to the same researchers input to IFPRI's linkages project (see E3).

The donors will provide financing for the project, with a grant for start-up costs in the amount of $25,000 to be provided in dollars by the Ford Foundation directly to IFPRI. This grant will support IFPRI staff travel and other dollar costs at IFPRI relating to the development of the project. Other project related costs for both IFPRI and BIDS activities will be paid from a pooled fund to be created by the sponsoring organizations.

The project has been approved by the Government of Bangladesh, commitment of funds has been assured, and a formal agreement among donors, IFPRI and BIDS is scheduled for mid-October 1980.

In addition to the opportunity to participate in a joint activity with international and local organizations in the evaluation of a programme with important implications for food policy, IFPRI will expect to produce from this effort three reports reflecting the research interests of the three senior analysts assigned to the project.

3. India and Bangladesh

Linkages Project:

The focus of the linkages project is on the question: what do the indirect or the multiplier effects of agricultural growth mean for the poor in terms of the expansion of their income and employment opportunities. This research area is one of the core activities of IFPRI's production programme to which 2.3 person years of research time has been allocated in 1980 and 1981.

The Linkages project is being developed as a collaborative research effort between IFPRI core staff and institutions in developing countries. Through the Food for Work Project collaboration has been established with Bangladesh and the Bangladesh Institute of Development (BIDS). For India collaboration is being worked out with Tamil Nadu Agricultural University.

Research activities under the project will include:

- Econometric analysis of time series data to confront more directly the measurement of the dynamics of change induced by growth in food grains production, particularly its income and employment multiplier effects.

- Use of Social Accounting Matrices to trace the impact of change in various variables on the economy as a whole.
- Field research in India and Bangladesh.
- Analysis of the results of the data.

Support for the research based at IFPRI will be provided by IFPRI through its core budget. Support for the field research and for travel to bring developing country based researchers to IFPRI is being sought through special project funding.

It is anticipated that the collaborative research work will result in a research publication for each country area studied.

4. Bangladesh, the Philippines and Zambia

Food Subsidies and Nutrition Project:

The objective of this research project is to extend IFPRI's existing work on food subsidy/ration schemes in South Asia by reviewing what is known about such schemes in other areas of the world, including target oriented food distribution and benefits and costs involved in operating broad based and more narrowly targeted programmes in three countries: Bangladesh, the Philippines and Zambia. This research work is a major effort of IFPRI's distribution programme involving 1.25 senior research person years and related support services.

The research area is in two phases. The first, already under way and based largely at IFPRI, involves the review of the current state of knowledge in the field of food subsidy and nutrition policies and the etiology of malnutrition.

A main purpose of this first phase is to build linkages between IFPRI and local collaborating institutions as a prerequisite for the carrying out of Phase II of the research effort which involves country studies to be conducted by developing country researchers in conjunction with the IFPRI-based research staff.

To date collaborative linkages have been established:

- In Bangladesh through the Food for Work Program with the Bangladesh Institute of Development (BIDS).
- In Zambia with the Rural Development Studies Bureau of the University of Zambia and the National Food and Nutrition Commission.
- In the Philippines with Food and Nutrition Research Institute.

Special project funding is being sought for support of the country-based study activities.

Table 8 :

IFPRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
1. ASEAN countries Indonesia, Malaysia Philippines Thailand	Rice Policies Project (Joint project with IRRI, IFDC, and researchers and institutions in four rice producing countries of the ASEAN regional group, excluding Singapore)	E	1 Project Coord. 1 Field Coord. 3 Scientists 1 Scientist 2/ 1 Scientist 3/	sp, c	603,000	1.1.80 30. 9.83	UNDP. Others under negotiations
2. Bangladesh; BIDS	Food for Work Project	E	1 Project Coord. 2 Scientists	sp, c	450,000	1.7.80 31.12.84	WFP, CIDA, Ford Found., World Bank
3. India; Tamil Nadu Un. Bangladesh; BIDS	Linkages Project	E	1 Project Coord. 3 Scientists	sp	48,000	1.9.80 31.12.82	Ford. Found.
4. Bangladesh; BIDS Philippines; Food & Nutrition Research Institute	Food Subsidies & Nutrition Project	E	1 Scientist	sp	120,000	1.1.80 31.12.83	U.N. Univ.; Others under negotiations

1/The staff listed are not all working full-time on each project. See breakdown of man-years in the narrative

2/ IFDC Staff - 3/ IRRI Staff

Table 8 :

IFPRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
Zambia; Univ. of Zambia and Nat. Food & Nutrition Commission								

Off-Campus Activities - CIMMYT

A International Testing

1. The international testing networks coordinated by CIMMYT for maize, bread wheat, durum wheat, triticale and barley are a major form of linkage with national programme collaborators. In 1979, for example, CIMMYT sent out over 3000 sets of seeds, which included more than 50 different types of nurseries. This amounted to over 1 million individual seed packets sent to collaborators in 134 countries. These nursery sets included materials from national programmes as well as from CIMMYT. Nursery categories include nurseries for general screening and yield performance, resistance to specific diseases, adaptation to rainfed and irrigated conditions and adaptation to different altitudes and latitudes. Monitoring teams (regional and headquarters-based staff) periodically visit the nursery sites of collaborators. Nursery data processing and reporting are performed by CIMMYT.

B National Cooperative Projects

Some national programmes within the worldwide network of maize and wheat growing countries have asked for direct staff assistance and exhibited a strong commitment to develop effective national crop improvement and production research programmes. CIMMYT receives special funding to provide this collaboration.

CIMMYT staff assigned to national programmes work on a daily basis as full-time associate staff to help organize maize and wheat improvement and production programmes, develop research facilities and train national staff. Once a national programme is reasonably developed and operating, the CIMMYT staff is withdrawn although continuing contact is maintained.

2. Pakistan

Both the maize and wheat programmes have staff seconded to Pakistan. A Ford Foundation Grant of $ 2,527,350 covering a 15 year period (1965-80) and a USAID grant of approximately $ 1,134,000 covering a five year period (1976-80) have enabled CIMMYT to maintain its staff in Pakistan. During this period CIMMYT has had various teams of breeders and agronomists assigned to the country. At present one maize breeder and one wheat agronomist are assigned to Pakistan. On-farm research receives considerable emphasis in both programmes.

3. Zaire

A Zairian grant of $ 2,548,750 covering the period 1971-81, and USAID grants (for training) of $ 391,000 covering the periods 1977-79 and 1980-81, support this cooperative effort. The CIMMYT team has varied in size and has included breeders, agronomists, pathologists and a training officer. In 1980, only one breeder/agronomist is assigned to this programme. Major activities include varietal development, plant protection research, training for national staff and on-farm research.

4. Tanzania

Grants from USAID (subcontracted through IITA) of $ 1,136,942 covering 1973-76 and $ 241,000 covering 1976-80 have supported this programme. A two-man team (breeder and agronomist) is assigned to the Tanzanian maize programme. Special breeding attention has been given to developing greater resistance to streak virus in adapted maize materials. The development of national programme staff, experiment station facilities and on-farm research programmes are major components of CIMMYT-Tanzanian cooperation.

5. Ghana

A grant from CIDA (Canada) of $ 588,150 covering the years 1979-83 supports this programme. One agronomist is assigned to the national maize research programme. On-farm research and national staff development are major priorities.

6. Algeria

Ford Foundation grant totalling $ 470,350 covering the period 1979 to 1982 is funding a special project in Algeria. The purpose of the grant is to undertake an economic study of the country's cereal sector and to provide advanced training for the staff of the Algerian Institute for the Development of Field Crops. At present, one resident staff member, an agricultural economist is assigned to the Algerian National Programme.

C, D Regional Programmes including Core Research outside the Host Country

CIMMYT has assigned staff to regional programmes based in Africa, Asia and Latin America. These regional staff are integral members of the maize, wheat and economics programmes.

Typically, regionally assigned staff provide leadership in the following CIMMYT programme activities:

(1) Special breeding problems in which the region provides the most suitable research base;

(2) Crop production research, particularly agronomy;

(3) Monitoring of international and regional testing trials and nurseries;

(4) Coordination and improvement of training opportunities for national staff, within and outside of region; and

(5) Feedback to Mexico-based research and training programmes on production problems affecting agriculture within the region.

Each region includes a number of countries (which may differ for each CIMMYT programme), usually geographically contiguous, which possess similar production environments and problems. Such countries agree to strengthen through regional cooperation the exchange of germplasm and scientific information. Regional programmes for maize, wheat and economics are described below.

7-11. Maize Regional Programmes

By mid 1980, CIMMYT had maize staff assigned to five regional programmes, as described below:

Area	Started	1980 CIMMYT staff	Current donor
7. Central American and Caribbean	1974	1 breeder 1 agronomist	Switzerland
8. Asia	1976	1 breeder/agronomist	UNDP
9. Andean	1976	1 breeder/agronomist 1 breeder, 1 entomologist	Canada
10. Mideast	1979	1 breeder/agronomist	Core Unrestricted
11. West Africa	1980	1 breeder	Core Unrestricted

In addition to the regular regional activities, each maize regional programme is responsible for specific breeding activities within the total

maize improvement programme. These include downy mildew resistance (Asia), streak virus (West Africa), floury maize improvement (Andean), temperate-tropical maize improvement (Mideast) and corn stunt (Central America).

12-16. Regional Wheat Programmes

By mid 1980, the following regional wheat programmes were in operation:

Area	Started	1980 CIMMYT staff	Current donor
12. Disease Surveillance	1973	2 pathologists [1/]	The Netherlands
13. East Africa	1975	1 breeder [1/]	UNDP
14. Andean	1976	1 breeder/pathologist	Canada
15. Southern Cone	1978	1 agronomist	Japan
		1 breeder	
16. North-West Africa	1980	1 breeder	Core Unrestricted

Again, as in the maize regional programmes, regional wheat scientists play special roles in the total CIMMYT germplasm improvement scheme. Screening of materials in disease hot spot areas is as follows: stripe rust (East Africa and Andean), stem rust (East Africa), Septoria (North- West Africa), rynchosporium (Andean), barley yellow dwarf (Andean and Southern Cone) and Helminthosporium (Asia and East Africa). In addition, the disease surveillance programme monitors disease situations in the wheat-growing area stretching from Asia to North and East Africa. The wheat programme also operates regional disease screening and yield nurseries.

17-20. Economics Regional Programme

In 1980, the Economics Programme had staff assigned to four regional programmes, as follows:

1/ In addition to regularly assigned CIMMYT staff, the Dutch Government has assigned two pathologists as associate staff in East Africa, and in the Mediterranean and Middle East.

Area	Started	1980 CIMMYT staff	Current donor
17. East Africa	1975	1 agric. economist 1/	UNDP
18. Andean	1977	1 agric. economist 1/	Core Unrestricte
19. Central America and Caribbean	1978	1 agric. economist	Switzerland
20. Asia	1976	1 agric. economist	UNDP

The emphasis in all regional economics programmes is on the development and introduction of interdisciplinary research procedures aimed at improving production-oriented research activities which lead to farmer recommendations. The on-farm research strategies advocated by CIMMYT feature strong links between biological and social scientists.

E Collaborative Research Projects

E1 With Developing Countries

In a general sense, almost all of CIMMYT's crop improvement and production research is in collaboration with scientists in developing countries. The international germplasm improvement and testing networks include materials submitted by national programmes as well as those emanating from the CIMMYT breeding programme in Mexico.

There also are special breeding efforts with particular countries which are referred to by CIMMYT as "collaborative research projects". In these cases, CIMMYT engages in a "shuttle breeding" effort with selected countries to accelerate research progress on a particular problem (e.g. downy mildew or aluminum toxicity tolerance). Through shuttle breeding, two alternate breeding cycles are carried out each year, one in the collaborating country (e.g. screening for disease resistant or soil toxicity tolerant materials) followed by a breeding cycle in Mexico for general agronomic improvement of the superior materials. In most of these cases CIMMYT and its collaborators jointly underwrite the costs associated with the project. In some cases, CIMMYT provides modest financial support to provide simple equipment needed by project collaborators or to facilitate travel of collaborating scientists to observe the performance of their selected materials in the CIMMYT-Mexico nursery (or trial cycle).

1/ In addition to the regular CIMMYT staff, one post doctoral fellow is assigned to the Andean region and one predoctoral fellow is assigned to East Africa.

E2 With Developed Countries

21-23. CIMMYT's involvement with scientific institutions in the developed world tends to emphasize basic scientific research such as the spring x winter wheat crossing programme with Oregon State University,USA, the wide crosses research with Kansas State University (both now completed) and the maize temperate x tropical crossing programme with Hohenheim University, Federal Republic of Germany. Many collaborative basic studies in genetics, pathology, cytology are also under way with more than 30 institutes in 12 developed countries. Most of these arrangements are financed through special grants to the collaborating institutions with CIMMYT cooperating in the supply of germplasm and monitoring research results.

G Germplasm Collection, Preservation and Utilization

24. CIMMYT operates germplasm bank units for maize, wheat, barley and triticale. These units maintain, catalogue and regenerate seed; and handle special seed requests and shipments to cooperators.

CIMMYT has the world's largest collection of maize germplasm (and related species), numbering approximately 13,000 accessions in cold storage. The wheat programme, up to 1980, only has operated a minimal short-term cold storage seed maintenance unit for its four crops. CIMMYT is now building a new wheat germplasm facility which is slated for completion in 1981. In addition to germplasm maintenance, per se, the wheat bank also will have sufficient space for actual working collections and for small-scale seed supply increases for other collaborating countries. This programme is supported largely from core budget funds.

H Training and Follow-up

25. In-service trainees, visiting and associate scientists and fellows at CIMMYT number around 300 per year. Approximately 140 of these are in-service trainees in wheat, maize and economics. Most of these trainees spend one crop season in Mexico (5-7 months) in one of the 13 in-service training courses offered each year in breeding, production agronomy, economics, experiment station management and laboratory sciences.

Visiting and associate scientists spend from several weeks to one year working within CIMMYT's research programmes. Graduate students and postdoctoral fellows spend from one to two years as associate staff within the programmes. Graduate student fellows conduct thesis research under the guidance of CIMMYT staff. Regionally and nationally assigned staff, along with programme staff and training officers in Mexico, frequently participate

in in-country training programmes, field days and workshops.

CIMMYT staff, assigned to headquarters and outposted to regionaland national programmes, make considerable efforts to keep in touch with many of the several thousand scientists who have participated in CIMMYT training programmes. Many of these alumni are international testing collaborators who maintain ongoing and close contact with the CIMMYT staff.

I Consultation to National Programmes

26. CIMMYT's years of research and production experience under varying conditions prompt many national programme calls for counsel on the organization of research on maize and wheat and on ways to reduce constraints limiting production. While CIMMYT has no formal, scheduled programme of consultation to national programmes, CIMMYT staff travel extensively, reaching more than 70 countries in the collaborator network each year.

Table 9

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To 1/	
1. Worldwide	Maize, Wheat, Triticale, Barley Nurseries	A		c	-	1965	Indefinite	-
2. Pakistan	Strengthening national Programmes	B	1 Maize Breeder 1 Wheat Agronomist	sp	3,661,350	1965	1980	Ford Found. USAID
3. Zaire	Strengthening national Programmes	B,H	1 Breeder/Agronomist	sp	2,548,750	1971	1981	Government of Zaire
4.Tanzania	Strengthening national Programmes	B,H	1 Breeder 1 Agronomist	sp	1,377,942	1973	1980	USAID
5. Ghana	Strengthening national Programmes	B,H	1 Breeder/Agronomist	sp	588,150	1979	1983	CIDA
6.Algeria	Strengthening national Programmes	B,H	1 Agric. Economist	sp	470,350	1979	1982	Ford Foundation
7. Central Americ./ Caribbean(Maize)	Regional Coordination & Corn Stunt Research	C,D	1 Breeder 1 Agronomist	rc	1,700,000	1976	1982	Switzer-land
8. Asia (Maize)	Regional Coordination & Downy Mildew-Research	C,D	1 Breeder/Agronomist	rc	2,808,290 2/	1976	1984	UNDP

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
9. Andean (Maize)	Regional Coordination & Floury Maize Improvem.	C,D	1 Breeder/Agronomist 1 Breeder 1 Entomologist	rc	1,145,000	1976	1980	CIDA
10. Mideast(Maize)	Regional Coord. & Temperate-Tropical Maize Improvement	C,D	1 Breeder/Agronomist	c	-	1979	Indefinite	-
11. West Africa (Maize)	Regional Coord. & Streak Virus Research	C,D	1 Breeder	c	-	1980	Indefinite	-
12. Disease Surveillance (Wheat)	Early Warning Disease Surveillance	C	2 Pathologists	rc	2,761,440 2/	1974	1982	Netherlands
13. East Africa (Wheat)	Regional Coord. & Stripe Rust & Helminthosporium Res.	C,D	1 Breeder	rc,c	1,824,870 3/	1975	Indefinite	UNDP
14. Andean (Wheat)	Regional Coord. & Stripe Rust, Stem Rust Rynchosporium, Barley Yellow Dwarf Research	C,D	1 Breeder/Pathologist	rc	641,215	1976	1980	CIDA
15. Southern Cone (Wheat)	Regional Coord. & Barley Yellow Dwarf Research	C,D	1 Agronomist 1 Breeder	c,rc	1,700,000 3/	1978	Renewed annually	Japan

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
16. North and West Africa (Wheat)	Regional Coord. & Septoria Research	C,D	1 Breeder	c	-	1980	Indefinite	-
17. East Africa (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	1,000,000 2/	1975	1984	UNDP
18. Andean (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	c	-	1977	1981	-
19. Central America/Caribbean (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	109,200	1977	1982	Switzerland
20. Asia (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	700,000 2/	1979	1984	UNDP
21. Yugoslavia	Rust Identification	E2		c		1975	Indefinite	
22. Israel	Rust Identification	E2		c		1975	Indefinite	

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
23. Germany	Temperate x Tropical Maize Crossing	E2		c		1978	Indefinite	
24. Worldwide	Germplasm Collection, Preserv. & Utilization of Maize, Wheat, Barley, Triticale	G		c		1965	Indefinite	
25. Worldwide	Training & Follow-up (see text)	H		c 4/		1965	Indefinite	
26. Worldwide	Consultation to national Programmes (see text)	I		c		1965	Indefinite	

Explanation of footnotes:

1/ Some grants may be extended
2/ Approximate
3/ Restricted core only
4/ Many restricted core and special project grants also contain a training component

Off-Campus Activities - CIAT

Off-campus activities of CIAT are organized around the four commodities within the Centre's mandate (i.e. beans, rice, cassava, tropical pastures) and are presented accordingly.

Beans

A International Testing

1. International Bean Yield and Adaptation Nursery (IBYAN)

The CIAT Bean Programme utilizes a stepwise scheme to produce and test its improved germplasm. Materials are selected in two successive preliminary nurseries before being entered into the IBYAN, which is a replicated nursery that is shipped worldwide. In 1979, a total of 142 trials were shipped to 30 collaborating countries. Fifty-two of these trials (21 entries each) were for bush-type black materials; 70 trials (32 entries each) were for bush-type non-black materials; and 20 trials were for climbing beans. The evaluation parameters are primarily focused on yield and disease resistance.

2. Factor-specific Nurseries

The Bean Programme conducts a series of factor-specific nurseries with cooperating countries which include nurseries for: resistance to Apion godmani; resistance to Empoasca; high temperature tolerance; N-fixation capacity; resistance to rust; anthracnose; Golden Mosaic virus; web blight. The number of sites for these nurseries ranges from 3 to 17.

B National Cooperative Projects

3. Bean Research and Development in Guatemala

A major grant of USAID plus additional resources from the Rockefeller Foundation have made it possible for CIAT to station two bean researchers with ICTA in Guatemala for the purpose of adapting promising CIAT-generated materials to local conditions and to develop BGMV tolerant varieties.

4. National Bean Programme Development in Peru

A grant from the Swiss Government has enabled CIAT to place a bilateral bean researcher in Peru for a four-year period. This researcher acts as a liaison between the CIAT Bean Programme and Peruvian efforts in bean research/production.

C Regional Programmes

5. Regional Services: Central America/Caribbean

A major portion of a UNDP project for international cooperation activities that was funded from late 1977 through June 1980 was devoted to the placing of a regional services scientist in the Central America/Caribbean area. Currently, this effort is financed out of core. Responsibilities of this scientist include to assure free flow of materials and information between the region and CIAT, the selection of training participants and training follow-up, consultancy services to national programmes, and arrangements to assure free flow of information and materials between the countries of the region.

6. Improvement of Bean Production in Central America and the Caribbean

This regional bean project is to start in September 1980 and will include the regional services staff described in 5. above, plus two additional bean researchers. The project is intended to work in collaboratio with national programmes in the regional adaptation of promising CIAT and other materials, and to work on region-specific production constraints. This three-year project is Swiss funded.

E Collaborative Research

E1 With developing Countries
(3. and 4. above)

E2 With developed Countries

7. Gembloux University (Belgium)/CIAT

This collaborative research project is on germplasm evaluation (Phaseolus spp.), flowering physiology, and interspecific crosses. The Belgian Government grant finances complementary work carried out both at Gembloux University and CIAT. In this project are involved the direct services of four associate scientists: two working at CIAT as FAO associate experts, and two Belgian scientists working at Gembloux.

G Germplasm Collection

8. A three-year grant of IBPGR makes it possible for CIAT to collect - mostly through the services of national institutions - additional Phaseolus spp. germplasm material.

H In-Country Training Assistance

9. The Bean Programme, in collaboration with the Training Programme, assists various in-country training efforts which normally are organized, financed and conducted by collaborating national programmes. The CIAT-involvement is of a catalytic and advisory nature. The CIAT participation is financed out of a combination of various special projects and core resources. On a yearly basis, an average of one to two in-country efforts in bean research/production are supported by CIAT.

I Consultancy Services

10. An integral part of the work responsibilities of all senior staff members of the CIAT Bean Programme is to extensively consult with and advise national counterpart scientists.

Cassava

A International Testing

11. International Trials

The international trials as coordinated by the Cassava Programme currently are distributed over 12 countries in Latin America. These yield trials had been initiated four years ago and had reached a total of 21 cycles harvested by the end of 1979.

B National Cooperative Projects

12. National Regional Trial Networks 1/

The CIAT Cassava Programme assists collaborating national programmes in the organization, conduct and evaluation of national regional trial networks which contain promising CIAT lines, CIAT selections and national

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1/ "Regional" in the sense that these trials are conducted in different regions within a given country.

entries. In 1979, there were a total of 120 trial sites in 10 different Latin American countries and three Asian countries.

C Regional Programmes

13. Outreach Programme for Latin America

A five-year project funded by IDRC has enabled the Cassava Programme to employ one outreach scientist to provide outreach services to Latin American countries. This scientist is involved in the coordination of international trials, the assistance to national programmes in the organizati of national regional trials, the identification of training participants (including training follow-up), the facilitation of the flow of information and germplasm to and from collaborating programmes in Latin America and in providing consultancy services to national programmes. The IDRC grant for this project includes monies for training scholarships. This special project will come to its conclusion by the end of 1980.

14. Outreach Programme for Asia

A second IDRC-financed special project has contained funds for training scholarships of Asian cassava workers and for a regional services staff posted in the Philippines. The responsibilities for this cassava scientist were similar to the ones described for the outreach scientist in 13. above, but for the Asian region. This project terminated on 30 June 1980.

E Collaborative Research

E2 With developed Countries

15. Mycorrhiza Research

CIAT, in collaboration with the University of Goettingen, is now initiating research on the potential of mycorrhiza to increase crop productio on infertile soils with low P availability. The project will focus on cassav but will also investigate grain legumes and tropical pastures in an attempt to develop a utilization methodology for this natural resource. At the University of Goettingen (West Germany) long-term experience with mycorrhiza exists combined with interest to work in the tropics. The German Development Agency (GTZ) is financing the two-year research project which will include the stationing of one German scientist at CIAT.

H In-Country Training Assistance

16. In collaboration with the Training Programme, the Cassava Programme offers assistance to in-country cassava training courses. While the in-country training efforts are financed and organized with non-CIAT resources, the direct CIAT assistance to these courses is financed out of core funds or from funds from third parties. On a yearly basis, an average of one to two in-country cassava courses are provided direct CIAT assistance.

I Consultancy Services

17. Consultative services to national programmes are provided by the members of the Cassava Team on a continuing and extensive basis.

Tropical Pastures

A International Testing

18. Adaptation Trials

The primary attention of the Tropical Pastures Programme is given to the well-drained, tropical savanna of tropical America. Throughout this area, the Programme is conducting a network of regional trials in an effort to enhance and reinforce the evaluation work on tropical grasses and legumes as it is being conducted at two research sites within the well-drained savannas. At the same time, in order to evaluate forage germplasm on a preliminary basis for adaptation to areas within the Programme's mandate which do not fit the above description, another series of adaptation trials are being conducted in which more than 100 accessions of a series of species are being evaluated for adaptation to edaphic and climatic conditions. Sites of this latter type of trials are in Colombia, Venezuela, Peru and Brazil. All adaptation trials are conducted in collaboration with national programmes.

D Core Research Outside Host Country

19. Pasture Technology Development for the Cerrado Region

The well-drained, tropical savanna as referred to above consists of two distinct ecosystems: the so-called "hyperthermic" ecosystem (as represented for example, by the Eastern Plains of Colombia); and the so-called "thermic" ecosystem (as represented, for example, by the Cerrados of Brazil). While the former ecosystem receives full attention from CIAT within the Centre's host country, the latter ecosystem is being served by three core-funded out-posted research scientists located at a collaborating Brazilian research

institution (i.e. the CPAC station of EMBRAPA) in Brasilia. The scientists involved are a forage agronomist, a pasture development specialist and a cattle production specialist.

E Collaborative Research

E2 With developed Countries

20. IFDC/CIAT Phosphorus Project

This five-year special project which is financially supported by IDRC and UNDP channeled through IFDC involves the stationing at CIAT of two senior scientists. The project integrates the fertilizer research activities at IFDC on resource characterization, chemical engineering, pilot plant production of experimental fertilizers and initial effectiveness screening with the agronomic research activities at greenhouse and field levels at CIAT and with related activities in cooperating institutions in Colombia, Peru and Ecuador. The agronomic portion conducted on the acid, infertile soils of Latin America focuses on the measurement of (a) initial and residual P availability from local phosphate resources (i.e. indigenous rock phosphate deposits) and modified products produced from these by IFDC and (b) identification of the most effective P management strategies as affected by the inter-relationship between P source, soils properties, crop type and methods of application.

F Collection of Information and Data

21. Evaluation of Beef Production Systems

The Beef Production Systems Evaluation Project (ETES) is directed to analyzing beef farming operations in the two well-drained savanna ecosystems in Colombia and Venezuela and in Brazil. The project's first pahse involves analyzing selected farms in each region to define the prevailing technology and factors limiting beef production. The second phase is to involve the analysis of the effects of introducing new production technologies. This four-year project supported by the German Development Agency (GTZ) includes the stationing at CIAT of selected German associate scientists who closely collaborate with the CIAT and national programme counterparts involved in the Project.

I Consultancy Services

22. Consultancy services to national programmes are provided by the staff

of the Tropical Pastures Programme on a continuing basis and form an integral part of the staff's responsibilities.

Rice

A International Testing

23. Rice Testing Programme for Latin America

IRRI has placed at CIAT a liaison scientist for Latin America who is coordinating the International Rice Testing Programme for Latin America (see description in the IRRI section). All promising CIAT-developed breeding lines are also entered in this testing programme. In 1980, a total of 287 sets of the 14 nurseries in the Rice Testing Programme for Latin America have been sent to collaborators in the region.

C Regional Programmes

24. Regional Services for Central America

Some US$ 228,000 of a UNDP project in the area of CIAT international cooperation activities (total grant: US$ 1.6 million) was for providing regional services in rice to the Central American region. Accordingly, from late 1977 through May 1980 CIAT had stationed a regional services staff to the region (with headquarters in Costa Rica). His responsibilities included: to liaise between the CIAT Rice Programme and cooperating national programmes in the region; to engage in selected research activities on rice production constraints in the area; to select training participants (including follow-up); and to be instrumental in assuring the free flow of information and materials between the national programmes in the region.

E Collaborative Research Project

E1 With developing Countries

25. CIAT/ICA Collaboration

From the beginnings of CIAT's rice activities, a very close and special relationship with the Instituto Colombiano Agropecuario (ICA) has characterized the rice technology development work. Much of the hybridization and evaluation work of CIAT is done in direct collaboration with ICA, both at installations and research sites of either CIAT or ICA. While there is no combined budget for the rice development work, each party contributes its resources to the overall effort. It should be pointed out, however, that

while there is much collaboration between CIAT and ICA in this area, the rice programmes of the two respective institutions nevertheless maintain a separate identity; there are many aspects of rice research and development that more befit an international centre and which are pursued by CIAT alone.

H In-Country Training Assistance

26. In collaboration with the Training Programme, the Rice Programme directly assist one to two in-country training courses through the assigning to such courses a CIAT rice training specialist, relevant training materials and selected course inputs by CIAT rice researchers. Whenever possible, the CIAT contribution is financed through special project contributions; if such are not available, limited core funds are utilized.

I Consultation to National Programmes

27. As is the case with the other CIAT programmes, the Rice Programme carries on consultation activities to national programmes on an extensive basis. Whereas there is no formal programme of consultation, the Programme scientists travel extensively throughout the Latin American region as part of their research endeavours and use these opportunities to consult with national counterparts and to provide assistance to the extent possible.

Training

28. On a yearly basis, more than 300 training participants work and study at CIAT. In recent years, some 50 % of these were participants of CIAT courses organized around the respective commodity programmes; these courses have a duration of 4 to 8 weeks. Some 50 additional training participants engage in a thesis project at CIAT, be it at the MS or the PhD level (CIAT collaborates with various universities with respect to formal degree programm while the academic portion of the study programme is completed at the respective university, the thesis portion takes place at CIAT. As CIAT is not a degree-granting institution, the degrees are awarded by the university involved). An additional group of trainees (which numbers close to 100 on a yearly basis) are postgraduate research interns who normally are research personnel at collaborating national institutions and are invited to work and study at CIAT under the personal supervision of a given senior scientist of the Centre for periods ranging from three to twelve months.

As most of the CIAT training participants continue their careers in the employ of collaborating national institutions, training follow-up is being provided by continuing contacts between the trainees and their counterparts at CIAT. At the same time, these former training participants become to form integral parts of the commodity research networks as organized by CIAT and thereby have a chance to interact not only with CIAT scientific staff, but also with colleagues in other countries.

In the recent past, some two-thirds of CIAT's headquarters based training activities have been financed out of core funds,while the remaining one-third was contributed through special projects.

Seed Project

29. Through a three-year grant from the Swiss Government in the amount of US$ 1,980,300 CIAT has established a Seed Unit that cooperates with the CIAT commodity programmes in multiplying, processing, storing and distributing advanced experimental breeder material and Breeder and Basic Seed to collaborating countries for farmer trials and/or further multiplication. The Seed Unit also extends technical collaboration to Latin American countries to meet a wide range of seed-related needs. The Seed Unit also engages in the training of governmental and private institutional personnel in various aspects and at different levels of seed industry and programme development and seed technology. Two senior scientists form part of the Seed Unit.

Note:

CIAT is host to two CIMMYT scientists who are part of the CIMMYT/CIAT Andean Regional Maize Unit. Detailed information on this endeavour can be found in the report on CIMMYT.

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
		BEANS						
1.		International Bean Yield & Adaptation Nursery	A		c			
2.		Factor-specific Bean Nurseries	A		c			
3.	Guatemala; ICTA	Bean Research & Development in Guatemala	B,El,I	(1 Bean Pathologist) 1 Bean Breeder	sp	375,800	20.2.77 31.12.80	USAID,Rockefeller Found.
4.	Peru	National Bean Programme Development	B,El,I	1 Bean Agronomist	sp	392,400	1.4.79 31.3.83	Switzerland
5.	Costa Rica	Regional Services: C.America/Caribbean	A,C,H,I	1 Bean Pathologist	sp,c	196,000	1.1.78 30.6.80	UNDP(1.10.77-31.12.79) Core(1.1.80-30.9.80)
6.	Central America	Improvement Bean Production: C.America/Caribbean	C,El	0 + (1 Bean Breeder, 1 Bean Pathologist, 1 Cropping Systems Agronomist)	sp	1,145,500	1.9.80 31.12.83	Switzerland

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
7.	Belgium; Gembloux Univ.	Germplasm Evaluation, Flowering Physiology, Interspecific Crosses	E2	2 Assoc.Scientists 1/	sp	400,200 2/	23.5.77	31.12.80	Belgium
8.		Germplasm Collection	G		sp	61.000	1.1.78	31.12.81	IBPGR
9.		Assistance to In-country Training Courses	H		sp,c				Collab. national programmes
10.		Consultancy Services to national Programmes	I		c				
	CASSAVA								
11		International Trials	A		c				
12.		National Regional Trials	B						
13.		Outreach Programme for Latin America	A,B,C,G H, I	1 Cassava Agronomist	sp	340,000	6.2.76	31.12.80	IDRC
14.	Philippines	Outreach Programme for Asia	A,B,C,F H, I	(1 Cassava Agronomist)	sp	398,000	3.3.76	30.6.80	IDRC

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
15.	Germany; Goettingen Univ.	Mycorrhiza Research 3/	E2	1 Soil Microbiologist	sp,c	48,100 4/	15.8.80	14.8.82	W.Germany
16.		Assistance to In-Country Training Courses	H		sp,c				
17.		Consultancy Service to national Programmes	I		c				
	TROPICAL PASTURES								
18.		Adaptation Trials	A		c				
19.	Brazil	Pasture Technology Development for the Cerrado Region	D,E1	1 Forage Agronomist 5/ 1 Pasture Dev.Specialist 5/ 1 Cattle Prod.Specialist 5/	c				
20.	USA; IFDC	Evaluation of Indigenous Phosphate Resources as Fertilizer	E2	2 Soil Scientists	sp	897,500	12.7.77	30.6.82	IDRC, UNDP
21.	Brazil, Venezuela, Colombia	Evaluation of Beed Prod. Systems	F,E1	3 Assoc.Scientists	sp	388,000	19.1.78	18.1.81	W.Germany

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
22.		Consultancy Service to National Programmes	I		c				
	RICE								
23.		Regional Rice Testing Progr.	A,C		sp 6/				
24.	Costa Rica	Regional Services:Central America	C,H,I	1 Rice Breeder	sp	228,000	1.10.77	31.5.80	UNDP
25.	Colombia; ICA	Breeding plus Evaluation of Segregating Materials	E1		c 7/				
26.		Assistance to In-country Training Courses	H		sp(c)				
27.		Consultancy Services to national Programmes	I		c				
	TRAINING								
28.		Headquarter-based Training Activities	H		c,sp				Various

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
	SEED PROJECT							
29.	Seed Unit	I,II	2 Seed Specialists 8/	sp	1,980,300	7.11.78	6.11.81 9/	Switzerland

Footnotes:

1/ Two FAO associate experts are stationed at CIAT; two additional associate scientists are working on the project in Belgium.

2/ Two FAO associate experts not included.

3/ In collaboration with University of Goettingen.

4/ Special project contribution by GTZ; does not include scientist.

5/ One of these positions was special project funded under an international cooperation grant from UNDP for the period 4.2.78 - 30.6.80.

6/ IRRI has stationed at CIAT an IRRI liaison scientist who coordinates the International Rice Testing Programme for Latin America.

7/ Core funds are used for CIAT contribution only; the counterpart (Instituto Colombiano Agropecuario) finances its own contribution.

8/ Posted at CIAT.

9/ The financing of a second phase (i.e. an additional two years) has been earmarked by the Swiss Government.

Off-Campus Activities - CIP

B National Cooperative Projects

1. Rwanda

The Belgium AGCD is financing two CIP scientists in Rwanda at $ 120,000 for a five-year period. The principal financial support for the Rwandese research programme comes from the same donor through bilateral aid. The responsibilities of the team include introduction of improved germplasm, a multiplication scheme for seed potatoes, on-farm trials of improved technological packages and overall development by in-service training of research personnel. The team members are an agronomist and virologist. This project is expected to link in with bilateral support for Burundi and other neighbouring states and to become a focal point for improved technology.

2. Tunisia

CIP receives approximately $ 60,000/annum from CIDA, Canada, to station one scientist in the country whose principal task has been to establish a seed production scheme to reduce dependance on imported seed. The project is in its final year. At present it is not intended to renew the project in 1981, but plans are being made to capitalize on the success of the programme and develop a regional programme for francophone Africa by 1982 with Tunisia as the headquarters.

An annual one-month seed production course in French has been conducted in Tunisia for the past three years. Funds up to $ 30,000 are provided by AGCD Belgium and participants come from as far away as Madagascar. This is the only French course of its type anywhere in the world.

3. Nepal

Funds are provided by the Swiss Technical Assistance Agency, approximately $ 250,000 during the second phase of three years for one scientist to work with the Nepalese programme. The project is now in its fifth and final year and it is not proposed to extend in 1981 now that a large Swiss Technical Assistance team has taken over the principal responsibilities of the CIP expert. The project aimed at developing technical capability within the programme and identifying and multiplying varieties

with resistance to the main diseases and pests found in Nepal. A number of clones have advanced to varietal status. Identifying candidates for advanced training has been especially important as the Nepalese programme had to be established without reservoir of trained personnel. Part of the project funds are being used to finance advanced degree training.

4. Bangladesh

The funds for this project are administered by IADS and will probably continue for three years. One ex-CIP potato expert is now on the staff of IADS and working with the national programme. Technical support for the project is provided through our regional programme in India.

5. Central America

The role of CIP is different in this project to any other. The principal task is to coordinate research activities within six countries, Mexico, Guatemala, Honduras, Costa Rica, Panama and Dominican Republic to provide the basis for a complete regional potato research programme. Funds for the project, approximately $ 1,900,000 over five years are provided by the Swiss Technical Assistance Agency. More than 95 % of the funds are channeled to national potato research programmes to be administered by their own organizations. CIP financed the Coordinator post during the start up phase until June 1980, and continues to support on technical problems and in technical evaluations through short-term consultancy visits.

C Regional Research Programme

6-13. This is the core funded network through which CIP evaluates and transfers its germplasm and other technology to national programmes. In Kenya, Turkey and Philippines, regional evalutation, multiplication and distribution centres have been or are being established to receive improved germplasm from CIP. These are locally evaluated and best clones redistributed to other countries of the region. Other technology such as low-cost storage, production of potato from botandral seed and seed potato multiplication techniques are tested and developed by the regional scientists.

D Off-Campus Core Research Activities

A list is given of major research activities financed by core funds both in developed and developing countries. This has been a feature of CIP

core research from the beginning and has been a very effective way of utilizing expertise and facilities in those institutions with on-going related research programmes.

14-16. Recently CIP has utilized two post-doctoral positions to expand off-campus research in Turkey and the Middle East in tuber-moth epidemiology and control; and in the Philippines, to evaluate the Optimizing Productivity strategy. More use will be made of this type of investigation, both full and on part-time basis. At present a nutritionist post-doctoral is in Rwanda for five months on a case study of the role which potatoes can play in an African diet.

E Collaborative Research Projects

E1 With Developing Countries

1-4.; 6-13.; 15.

Major core projects are covered under Section D. No major non-core research projects are contemplated at this time. Minor collaborative projects are taking place in several countries, which may involve small amounts of core funds up to approximately $ 5,000 to assist in the purchase of materials, labour, etc. to advance the project. These types of investigations cover late blight resistance (Colombia); evaluation of germplasm and botanical seed technique (Ethiopia); evaluation of tropically adapted germplasm (Sri Lanka); and testing of low cost storage technology (Peru, Colombia, Philippines).

E2 With Developed Countries

17-28. See Table 11.

H Training and Follow-Up

1-4.; 6-13.

Most in-service or short-term group training is conducted at regional headquarters. CIP, Lima offers training on an individual or small group basis in such subjects as virology, pathology, meristem propagation and other specialist subjects. A number of Spanish speaking students on CIP scholarships are always conducting research for M.S. using the Lima facilities with course work at the nearby Agricultural University of La Molina. A few selected scientists receive scholarships for higher degree training at universities in developed countries. Recently a research

programme for mid-career scientists has been started to enable key persons to work at CIP using our facilities and genetic materials.

I Consultation to National Programmes

3-4.; 6-8.; 10-11.; 13.

The Regional Programmes are the principal contact with national programmes and arrange consultancies as indicated. In the event that a specialist consultation is requested and cannot be accommodated locally, opportunity is taken to use visits by CIP scientists coming to the region to evaluate collaborative research projects. Funds have been made available by The Netherlands and German Governments which permit CIP to request their national scientists for special consultancies.

All consultancies are primarily of a technical nature, however, assistance is given by the regional scientists when asked to revise proposals for bilateral assistance to potato research in order to see that all the main components are adequately catered for.

Table 11:

CIP Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
1. Rwanda	Strengthening national Research Capability	B,El,H	1 Virologist 1 Agronomist	rc	120,000 p.a.	1978	1983	Belgium(AGCD)
2. Tunisia	Strengthening national Seed Production	B,El,H	1 Agronomist	sp	60,000 p.a. 30,000 p.a.	1976	1981	Canada Belgium(AGCD)
3. Nepal	Support for Nepalese Potato Programme	B,El,H,I	1 Agronomist	sp	250,000/ '78-81	1976	1981	Switzer-land
4. Bangladesh	Support for Bangladesh Potato Programme	B,El,H,I		administered by IADS				World Bank
5. Central America	Regional Collaborative Research Project	B,C	1 Agronomist 1/	sp	1,900,000 (5 years)	1979	1984	Switzer-land
6. Kenya	Regional Research Programme	C,El,G,H, I	1 Agronomist 1 Assoc.Agronomist	c	180,000 p.a.		open	Assoc.Scientist-Netherlands
7. Turkey	Regional Research Programme	C,D,El,G, H,I	1 Agronomist 1 Assoc.Agronomist	c	218,000 p.a.		open	Assoc.Scientist-Netherlands
8. Turkey	Tuber Seed Multiplication	C,El,H,I	1 Agronomist	rc		1979	1981	Germany

1/ until June 1980

Table 11 :

CIP Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
9.	Philippines	Regional Research Programme	C,D,E1,G,H	1 Agronomist	rc	175,000 p.a.	open	Australia
10.	Colombia	Regional Research Programme	C,E1,G,H,I	1 Agronomist 1 Assoc.Agronomist	c	190,000 p.a.	open	Assoc. Scientist Belgium
11.	Costa Rica	Regional Research Programme	C,D,E1,H,I	1 Agronomist 1 Agronomist on sabbatical	c	114,000 p.a.	close 1981	
12.	Pakistan	Regional Research Programme	C,E1,H	1 Agronomist	c	120,000 p.a.	open	
13.	India	Regional Research Programme	C,E1,F,H,I	1 Agronomist	c	110,000 p.a.	open	
14.	Turkey	Tuber-moth Research	D	1 Post-doc.	c		1979 1982	
15.	Philippines	Testing of Agro-economic Technology	D,E1	1 Post-doc.	c		1980 1982	
16.	Rwanda	Role of Potatoes in African Diet	D	1 Post-doc.	c		1980 (5 months)	
17.	USA; Cornell Univ.	Utilization of Solanum andigena Germplasm in Potato Improvement	E2		c	73,000 p.a.	open	

Table 11 :

CIP Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
18.	USA; N.Carolina Univ.	Use of Diploid Potato Species in Breeding	E2		c	23,000 p.a.	open	
19.	USA; Wisconsin Univ.	Developing Resistance to bacterial Wilt & Adaptation to tropical Conditions	E2		c	34,000 p.a.	open	
20.	USA; Wisconsin Univ.	Use of 2n Gametes in Breeding	E2		c	18,000 p.a.	open	
21.	Canada	Response of Tuberosum Genotypes to Environm. Stress	E2		c	12,000 p.a.	open	
22.	Netherlands; Wageningen	Use of wild Species in Breeding	E2		c	25,000 p.a.	open	
23.	Netherlands; Wageningen	Breeding for Eelworm Resistance	E2		c	22,000 p.a.	open	
24.	Germany; Braunschweig	Use of Electrophoresis for Clonal Determination	E2		c	24,000 p.a.	open	
25.	Germany; Univ.Hohenheim	Physiological Studies on Tuberization	E2		c	13,000	1978 1980	

Table 11 :

CIP Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
26. Argentina; INTA	Use of major Variability for Potato Breeding	E2		c	10,000 p.a.	open		
27. Colombia; ICA	Evaluation of Resistance to Pseudomonas solanacearum	E2		c	6,000	1980	1983	
28. Australia; Victoria	Germplasm Multiplication for Southeast Asia	E2		rc	48,000	1978	1983	Australia

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THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

COMPENDIUM

OFF-CAMPUS ACTIVITIES

INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

TAC SECRETARIAT
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
August 1980

NOTE BY THE SECRETARIAT

This Compendium has been compiled by the TAC Secretariat from information supplied by the Centers individually as of August 1980. The information was included directly in the Compendium without amendment, since time was too short to re-check the whole document with the Centers prior to its issuance.

A second edition may be necessary to incorporate amendments which the Centers, TAC, the countries or donors concerned may wish to make on the format or contents of the document when considering the totality of the Centers' contributions to this Compendium. For example, some centers have reported training only in terms of that actually conducted off-campus while others have included a description of their training programs conducted on-campus as well.

The cooperation of the Centers in the preparation of this Compendium is gratefully acknowledged, especially as regards their observance of the guidelines which were finalized during the workshop held in late June and short deadlines given to them for sending their updated contributions.

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COMPENDIUM

OFF-CAMPUS ACTIVITIES

INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

I. INTRODUCTION

This Compendium of IARCs' Off-Campus Activities has been compiled as an Addendum to the "Report on the Stripe Analysis of the Off-Campus Activities of the International Agricultural Research Centres" 1/, to provide a comprehensive résumé of all Centres' activities of such nature.

The present issue is the result of the discussions of a first draft presented at a Workshop, held at CIMMYT Headquarters on 25-27 June 1980, in which participated the three TAC consultants who conducted the stripe analysis, several TAC members, most of the Centre Directors or their representatives and a Co-Sponsor's representative. In a personal capacity, there were also participants from developed and developing countries.

An outline of the Compendium, improved in the light of the Workshop's discussions, was then further discussed with Centre Directors in the 24th TAC Meeting and accepted as a model.

Centre Directors provided the TAC Secretariat narratives on their Centres' off-campus activities and also the summary tabulations. Those Centres which have not been included in this Compendium, either have no off-campus activities or their contribution did not reach the TAC Secretariat in time for inclusion when this document had to be sent for printing.

II. EXPLANATORY NOTES

The explanatory notes below refer to the respective columns of the tabulations, but include some cross-references to the narratives.

First column - "location":

- numbering relates to corresponding narrative sections of the IARC in question;
- if left blank, either no specific country involved, or too many countries involved to be listed.

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Second column - "off-campus activity":

- descriptive title of the activity/project.

Third column - "category":

- based on the classification of off-campus activities adopted by the consultants, subsequently amended by the Workshop and finally agreed upon by the 24th TAC Meeting, the following categories of activities have been adopted:

  A - International testing programme

  B - National cooperative projects, with outposted staff (usually non-core)

  C - Regional programmes

  D - Core research outside host country, with outposted staff

  E - Collaborative research
  E1 - with developing countries
  E2 - with developed countries

  F - Collection of information and data

  G - Germplasm collection, preservation and utilization

  H - Training and follow-up

  I - Consultancy services to national programmes

  The narratives of each Centre have been arranged according to these categories, and the capital letters preceding the definition of the categories have been used as a code in the tabulation;

- a particular activity may involve one or more categories.

Fourth column - "senior staff":

- (2 scientists) + 1 scientist: two already left, one in position;

- 2 scientists + (1 scientist): two in position, one expected to be filled.

Fifth column - "type" of funding:

- Coding used:
  - c - unrestricted core funding
  - rc - restricted core funding
  - sp - special project funding
  - l - funding through a loan

Sixth column - "amount" of funding:

- left blank if not specified by the Centre in question;
- if only the amount is indicated, it normally represents the total amount of funds for the entire duration of the project, unless indicated otherwise.

Seventh column - "duration - from .... to ....":

- left blank if not specified by the Centre in question;
- in places only number of years specified for the life of the project.

Eighth column - "donors":

- for acronyms see section III below.

III. ACRONYMS USED IN THE COMPENDIUM

AICRIP	All-India Coordinated Rice Improvement Project
AGCD	Administration Générale de la Coopération au Développement (Belgium)
CENARGEN	National Centre for Genetic Resources (Brazil)
CIAT	The International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CILSS	Comité Interétat de Lutte contre la Sécheresse dans les Pays du Sahel
CIMMYT	The International Maize and Wheat Improvement Center

CIP	The International Potato Center
COPR	Centre for Overseas Pest Research (UK)
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
DAAD	Deutscher Akademischer Austauschdienst
EMBRAPA	Brasilian enterprise for Agricultural Research
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IADS	International Agricultural Development Service
IBPGR	The International Board for Plant Genetic Resources
IBRD	World Bank
ICA	Instituto Colombiano Agropecuario
ICARDA	The International Center for Agricultural Research in Dry Areas
ICIPE	The International Center of Insect Physiology and Ecology
ICRISAT	The International Crops Research Institute for the Semi-Arid Tropics
ICTA	Instituto de Ciencia y Tecnología Agrícola (Guatemala)
IDA	International Development Association
IDRC	International Development Research Centre (Canada)
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
IITA	The International Institute of Tropical Agriculture
INIA	Instituto Nacional de Investigaciones Agrícolas (Mexico)
IRAT	Institut de Recherches Agronomiques Tropicales (France)
IRRI	The International Rice Research Institute
ISRA	Institut Sénégalais de la Recherche Agronomique
IVITA	Instituto Veterinario de Investigaciones Tropicales y de Altura
NIAE	National Institute of Agricultural Engineering (UK)
NCPC	National Crop Protection Council (Philippines)
NFAC	National Food and Agriculture Council (Philippines)
OAU	Organization of African Unity
ORSTOM	Office de la Recherche Scientifique et Technique d'Outre-Mer (France)

PCARR	Philippine Council for Agricultural Resources Research
PRECODEPA	Programa Regional de Cooperación en Desarrollo de la Papa (Central America)
RIDT	Royal Irrigation Department of Thailand
SAFGRAD	Semi-Arid Food Grain Research and Development Project
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WFP	World Food Programme

IV. OFF-CAMPUS ACTIVITIES - INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

Brief Narrative Account

and

Tabulated Information

Off-Campus Activities - IRRI

A [1/] International Testing

1. [1/] This is a major activity of IRRI. In 1979, for example, the IRRI-coordinated International Rice Testing Programme (IRTP) sent out more than 1,100 sets of nurseries (seeds) from two central points: 928 went from IRRI to 55 countries and 254 sets of the Latin American nurseries from CIAT to 21 Latin American countries. The nurseries included resistance to specific insects and diseases and tolerance to such factors as drought, adverse soil conditions and cold temperatures. The varietal testing programme includes materials from national programmes as well as from IRRI. This extensive worldwide programme is supported by UNDP with grants averaging during the period 1975-79 about $ 500,000 annually. Monitoring teams composed of IRRI scientists and scientists from national programmes visit these nurseries periodically.

B National Cooperative Projects

Indonesia

2. Strengthening National Research Capability

A USAID grant of $ 992,000 over a four-year period has enabled IRRI to station a team of five scientists in Indonesia to strengthen national research capabilities. The members of the team are a rice breeder, a cropping systems specialist, an agronomist, a soil scientist, and an agricultural economist. The responsibilities of the group include genetic evaluation of rice, cropping systems research, and studies of agro-economic constraints to rice yields.

3. Machinery Project

Activities in the project include providing assistance to mechanization currently underway and determining what might be done to make it more effective. Manufacturers are contacted for the production of IRRI-type machines/equipment for rice production. Assistance is given to redesigning or modifying the machines to make them meet local needs more effectively. Demonstrations and exhibits are put up to illustrate what could be accomplished by utilizing various sources of mechanization.

Bangladesh

4. Support for Bangladesh Rice Research Institute

1/ Letters and numbers refer to those in the tabulation.

The foreign support for the Bangladesh Rice Research Institute (BRRI) is channeled through IRRI. A team of five scientists are stationed there. They are a research system specialist and IRRI representative, a rice production specialist, a rice breeder (deepwater rice), an agronomist, and an agricultural engineer. Financial support for this project, amounting to $ 2,200,000 from 1 January 1978 to 31 December 1980, comes from three sources: the Ford Foundation, the Australian Government and the Canadian International Development Agency. The general objective is to aid in the development of BRRI until it is able to continue on its own.

5. Strengthening Rice-Based Cropping Systems Research Capability

A second project at BRRI is designed to develop research capability in rice-based cropping systems. One scientist is assigned to this project. His salary and operating costs are provided by a grant of $ 361,800 (Canadian) over a two-year period.

Burma

6. Strengthening National Rice Research Capability

The cooperative project aims to develop and implement strong interdisciplinary programmes in rice varietal improvement, rice-based cropping systems, and machinery development and testing and to improve national capabilities in these and related research areas.

Pakistan

7. Small-scale Farm Machinery/Equipment

The Small Farm Machinery Industrial Extension Project has enabled IRRI to conduct economic and market evaluation studies to determine the potential of IRRI-designed machines; to determine their performance at selected locations; to provide continuous technical and in-country engineering assistance to their manufacturers; and to perform adaptive design and development work on those IRRI-designed machines which offer potential but lack sufficient compatibility in the original configuration to meet local farm-level needs. Pakistan through the Pakistan Agricultural Research Council is participating in the project. Among the machines that have received major attention are threshers and transplanters.

8. Applied Research Trials

The applied research programme is designed to demonstrate the feasibility of greatly increasing rice production in farmers' fields. In 1978 the applied

research trials conducted in the rice-growing districts of the Punjab and Sind provinces included: a) nitrogen placement; b) direct seeding of rice; c) trials to correct zinc deficiency; d) insecticide placement; and e) double cropping (rice followed by wheat). Based on the results of the applied research trials a package of technology is being developed whose effectiveness will be demonstrated on a whole-farm basis.

Sri Lanka

9. Rice Technology Improvement and Training

The primary objective of the cooperative project is the organization and implementation of multidisciplinary research programmes on varietal improvement and cropping systems including field trials designed to accelerate the dissemination and adoption of new technologies.

Thailand

10. Small-Scale Machinery Project (Industrial Extension)

Thailand is another of the sites for the Small Farm Machinery Industrial Extension Project. The objectives of the project in Thailand are similar to those in Pakistan and the Philippines.

Philippines

11. Technology Transfer

The IRRI crop production specialist works with the Philippine Masagana 99 production programme. The transfer of modern production technology through agricultural extension is emphasized.

12. Small-Scale Machinery Project

The Philippines is one of the sites for the Small Farm Machinery Industrial Extension Project. The objectives of the project have earlier been enumerated.

C. Regional Programmes

IRRI maintains several liaison scientists in various regions, as follows:

13. Indonesia and Malaysia; stationed in Bogor, Indonesia

14. Africa; stationed at IITA

15. Latin America; stationed at CIAT

16. India; a Ford Foundation employee serves as IRRI's liaison scientist in India

17. Thailand; an employee of the Rockefeller Foundation is IRRI's liaison scientist in Thailand

These scientists supervise and facilitate the operation of any collaborative research projects in their territory and pay particular attention to IRRI's network of testing, such as the International Rice Testing Programme with its various nurseries. They have close contact with government officials and assist in maintaining cordial relationships between IRRI and the cooperating governments and scientists. Liaison scientists are supported from core budget funds.

18. Cropping Systems Outreach

The project aims to increase food production in South and Southeast Asia through the identification and demonstration of more productive rice-based cropping systems. Specifically the objectives are: 1) to extend relevant methodology to farmer-participant in research and technology development for national programmes; 2) to provide reliable data from sites on the Asian agroclimatic grid to determine the potential for intensive cropping systems in each of the major rice-growing zones of Asia; 3) to facilitate exchange of information/experience among scientists; and 4) to provide a mechanism for joint programme planning and review between national programmes and IRRI.

D Core Research Programmes outside the Host Country

19. Deepwater Rice Project

IRRI has a deepwater rice project in Thailand, located at the Huntra station. One full-time scientist is assigned to this project. In 1979 IRRI budgeted $ 152,000 for this project, all from core funds. The rationale for locating this core project outside the Philippines is that there is no deepwater rice in the country, whereas there are extensive areas of it in Thailand. Furthermore, the Huntra Rice Station is designed specifically for deepwater rice research.

E Collaborative Research Projects

E1 With Developing Countries

Indonesia

20. Cropping Systems

The objectives of the cooperative cropping systems programme between the Central Research Institute for Agriculture, Indonesia, and IRRI are: a) to develop cropping systems for rainfed and partially irrigated rice areas; b) to adapt improved cropping systems through cooperative trials with farmers; and c) to train research and extension workers for active roles in cropping systems programmes in Indonesia.

India

21. Exchange of Germplasm, Breeding for Insect and Disease Resistance

The initiation of the collaborative project was a logical sequence to an earlier cooperative national (country) programme between the Government of India (through the All-India Coordinated Rice Improvement Project (AICRIP) and IRRI. While AICRIP has developed the necessary capability to carry on an efficient rice research programme for the country it was recognized that it would be mutually beneficial to continue to collaborate in finding solutions to problems of common interest. The project has two basic components: a) collaborative research on (1) collection and exchange of germplasm; (2) evaluation of germplasm; (3) biotype and strainal studies; and (4) crop production research and b) exchange of scientists.

Philippines

22. NFAC-National Crop Protection Centre Operations

The project has the same objectives as the technology transfer project but emphasizes the protection of the rice crop against insect pests and diseases.

23. NFAC-IBRD Resettlement Project

The resettlement project is a World Bank-assisted project of the Philippine Ministry of Agrarian Reform in the provinces of Agusan del Sur, Bukidnon and Capiz. The NFAC has responsibility for the overall agricultural development of the settlement areas. As such NFAC requested IRRI to provide technological support relative to the conduct of research in rice-based cropping systems in the resettlement areas.

24. Nutritional Evaluation Laboratory Project

The cooperative project is a joint effort with the Philippine Food and Nutrition Research Institute (FNRI). The objective is to investigate nutritional and acceptability problems related to rice-based diets in

in preschool children.

25. Organizing Small Farmers for Effective Use of Technology

The project is a cooperative effort between a number of Philippine institutions (Philippine Council for Agriculture and Resources Research, NFAC, National Irrigation Administration, Bureau of Plant Industry, and Bureau of Agricultural Extension) and IRRI. The rationale for the project is the realization that the potentials of the high-yielding rice technology requires a new level of collaborative organization among the small farmers of the Philippines. The project will examine how different ways of organizing small farmers help or hinder them in meeting these fundamentally organizational challenges.

Korea/Philippines

26. Collaborative Project on Screening for Cold Tolerance and Blast

At the beginning of each year Korean and IRRI scientists meet to discuss the previous year's results and to develop the work plans for collaborative research for the current year. For 1979 and 1980 the focus of the collaborative effort is on the rice blast disease and on cold tolerance.

27. Collaborative Project on Gene Rotation

This is a joint effort to produce rice seeds in the Philippines during the winter season in Korea with the objective of shortening the rice seed renewal period from five to three years. The ability to renew rice seeds (variety/varieties) used by the farmers will ensure the implementation of the "gene rotation programme" for rice blast disease control in Korea.

Indonesia/Philippines/Thailand

28. Project on Consequences of Mechanization

Mechanization poses the following paradox: On the one hand the direct function of mechanization is often seen as the replacement of labour which is undesirable in labour-intensive countries. On the other hand mechanization permits faster, less laborious completion of farm tasks, is claimed to raise yields and permit greater intensity of land use and raise labour productivity and income. Thus the project will evaluate the effects of farm mechanization on small rice farms in selected locations in Asia. In addition the project will develop an improved understanding of the tasks involved in different systems of rice production to provide guidelines for the design of mechanization appropriate for rice producers at different stages of development

Finally, the project will try to improve the capacity of researchers within the region to conduct such studies.

China/Cuba/Vietnam

29. Initiation of Collaborative Work with Scientists in Centrally Planned Economies

The special grant enables IRRI scientists and administrators to follow up initial attempts to include countries with centrally planned economies (e.g. China, Cuba, Vietnam) in the various research networks set up by IRRI, to provide their scientists the opportunity to participate in IRRI's conferences/workshops/training programmes, and to consider the possibility of developing special projects to support more extensive cooperation.

E2 With Developed Countries

USA/Philippines

30. Heterotrophic N-fixation

The goal of the project is to increase the nitrogen-fixing activity of the rice root zone in an effort to increase crop yield of small farmers and reduce their dependence on expensive chemical fertilizer. Emphasis is focused on biological nitrogen fixation in paddy fields by organisms such as blue-green algae, symbiotic blue-green algae with Azolla, and heterotrophic anaerobic bacteria.

G Germplasm Collection, Preservation and Utilization

31. Rice Germplasm Collection

The project is an accelerated field collection programme to cope with the rapid and widespread diffusion of the high-yielding varieties and the concurrent disappearance of traditional cultivars. The effort is being implemented in Bangladesh, Burma, China, India, Indonesia, Nepal, Sri Lanka, and Thailand.

IRRI has the world's largest collection of rice varieties and genetic lines, numbering approximately 60,000. This includes some 1900 varieties of Oryza glaberrima. Each accession in the collection is grown twice, and extensive notes are taken on the characteristics of each entry. This material is made available to rice breeders around the world. The rice germplasm collection, preservation and utilization programme is supported largely from core funds.

H Training and Follow-up

32. Regional Training

The training of young rice scientists has been an integral part of the Institute's activities since operations began in 1962. Fellows, scholars and trainees at IRRI number about 250 annually. Approximately 130 of these are research scholars or fellows, about 75 of whom are pursuing advanced degrees at the adjacent College of Agriculture of the University of the Philippines at Los Baños. The remainder are enrolled in shorter (two weeks to six months) courses in such subjects as genetic evaluation and utilization, cropping systems, agricultural mechanization, and rice production training. The UNDP regional training project enables IRRI to make available an additional 10 person-years of training to young and promising rice research workers in Asia.

IRRI has kept in close touch with its alumni. Many of them are now working in cooperative programmes around the world. In fact, no single factor has enhanced the success of its collaborative and cooperative programmes in rice-growing countries more than the contacts with and the assistance of IRRI alumni.

I Consultation to National Programmes

IRRI has no formal scheduled programme of consultation to national programmes. However, it carries on this activity extensively. Its scientists and administrators visit the national programmes around the world. IRRI invites rice scientists from all the important rice-producing countries to its international conferences and symposia. Their liaison scientists and other IRRI representatives stationed in foreign countries are in close contact with government officials and rice scientists. IRRI does not attempt to influence government policy, but, rather helps to solve the technological and sociological problems that limit rice production wherever they occur.

Table 1 :

IRRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Various	International Rice Testing Programme	A	2 Plant Breeders 1 Plant Pathologist	rc	7,738,000	Jan.80 Dec.84	UNDP
2. Indonesia;	Strengthening national research capability	B	1 Plant Breeder 1 Agronomist 1 Soil Scientist 1 Crop Syst. Agron. 1 Agric. Economist	sp	992,000	Oct.77 Dec.81	USAID
3. "	Machinery project	B	1 Farm Mach.Engineer	sp	313,000	Mar.78 Aug.80	USAID
20. "	Cropping systems	E1		sp	169,000	Oct.77 Oct.80	IDRC
13. " ; Bogor	Regional liaison (Indonesia & Malaysia)	C	1 Plant Breeder/ /Research Admin.	c	149,000	Jan.80 Dec.80	
4. Bangladesh; BRRI	Support for Bangladesh rice research institute	B	(1 Agronomist) + 1 Res. Syst.Specialist 1 Rice Prod.Specialist 1 Plant Breeder 1 Agric. Engineer	sp	2,624,000	Jan.78 Dec.80	CIDA, Australia, Ford Foundation
5. "; BRRI	Strengthening rice-based cropping systems research capability	B	1 Crop Syst. Agron.	sp	427,000	Jan.79 Dec.81	IDRC

Table 1 :

IRRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
6. Burma	Strengthening national rice research capability	B	1 Agric. Engineer 1 Plant Breeder 1 Crop Syst. Agron.	sp	2,084,000	Jan.79 Dec.82	CIDA
21. India; AIRCRIP	Exchange of germplasm, breeding for insect and disease resistance	E1		sp	200,000	June 79-June 82	Ford Foundation
16. " ; New Delhi	Liaison	C	1 Soil Scientist/ /Res. Admin.	c	27,000	Jan.80 Dec.80	
7. Pakistan	Small-scale farm machinery/equipment	B,C	1 Agric. Engineer	sp	457,000	Apr.76 Dec.80	Ford Foundation USAID
8. "	Applied research trials	B	(1 Rice Prod. Spec.)+ 1 Rice Prod. Spec.	sp/1	769,000	Jan.77 June 81	USAID loan
9. Sri Lanka	Rice technology improvement and training	B	(1 Plant Breeder, 1 Crop. Syst. Agron)+ 1 Crop Prod. Spec.	sp/1	3,125,000	May 77 Jan.82	USAID loan
19. Thailand	Deepwater rice project	D	1 Plant Breeder	c	166,000	Jan.80 Dec. 80	
10. "	Small-scale machinery project (industrial extension)	B	1 Agric. Engineer	sp	219,000	June 75 Aug.80	USAID
17. "	Liaison	C	1 Plant Br/Res.Admin.	c	68,000	Jan.80 Dec.80	

Table 1 :

IRRI Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
11.	Philippines	Technology transfer (National Food and Agriculture Council, NFAC)	B	1 Crop Prod. Spec.	sp/1	190,000	Sept.78 Aug.81	USAID loan
22.	"	NFAC-National Crop Protection Center operations	E1		sp	57,000	Sept.78 Aug.81	NFAC
23.	"	NFAC-IBRD resettlement project	E1		sp	16,000	May 78 May 80	NFAC
24.	"	Nutritional evaluation laboratory project	E1		sp	327,000	Sept.79 Aug.82	USAID
25.	"	Organizing small farmers for effective use of technology	E1		sp	260,000	July 78 Oct.80	Philippines through PCARR
12.	"	Small-scale machinery project (industrial extension	B, C	1 Agric. Engineer[1/]	sp	964,000	June 75 Aug.80	USAID
26.	Korea/ Philippines	Collaborative project on screening for cold tolerance and blast	E1		sp	16,000	1979 to 1980 crop season	Office of Rural Development, Korea

1/ Stationed at IRRI Headquarters.

Table 1 :

IRRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
27. Korea/ Philippines	Collaborative project on gene rotation	E1		sp	54,000	1979 1980 crop season	Office of Rural Development, Korea
18. South & South-East Asia	Cropping systems outreach	C	1 Crop Syst.Econ. 1/	sp	730,000	Jan.79 Dec.81	IDRC
28. Indonesia/ Philippines/ Thailand	Project on consequences of mechanization	C, E1	1 Agric. Econ. 1/	sp	654,000	Sept.77 Sept.80	USAID
29. China/Cuba/ Vietnam	Initiation of collaborative work with scientists in centrally planned economies	C, E1		sp	50,000	July 79 July 80	Ford Found.
31. Various	Rice germplasm collection	G		c, sp	20,000	Jan.80 Dec.80	IBPGR
30. USA/ Philippines	Heterotrophic N-fixation	E2		sp	1,237,000	Feb.76 Mar.80	UNDP
14. Nigeria; IITA	Regional Liaison Africa	C	1 Plant Pathologist/ Res. Admin.	c	126,000	Jan.80 Dec.80	

1/ Stationed at IRRI Headquarters

Table 1 :

IRRI Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
15.	Colombia; CIAT	Regional Liaison Latin America	C	1 Plant Breeder/ Res. Admin.	c	174,000	Jan.80	Dec.80	
32.		Regional training	II		sp	300,000	Jan.	Dec.80	UNDP

Off-Campus Activities - ICRISAT

A International Testing and Nurseries

1. The crop improvement programmes both at Headquarters and in country-based programmes provide materials for national and regional testing. In general, thus far, yield/adaptation, drought, pest and disease nurseries are provided from ICRISAT Hyderabad. This is an extremely important function as a wide range of germplasm is readily disseminated for use and tested for local adaptation and sources of stable resistances. A large number of scientists collaborate in assembling material for test. The programme is largely funded from core funds.

B, C, D 1/ National, Regional and Core Research Programmes outside the Host Country

2. - 8. 1/ Research and training for the improvement of sorghums and millets.

This activity is the major international off-campus activity of the ICRISAT. It is one which was initiated in 1975 under a 3 year UNDP special project and has continued into a second three year phase - a small number of posts being converted to core programme in 1979 and 1980. The objective of the programme is to breed, for growing in the semi-arid areas of Africa, cultivars of sorghum and millet which have high yields, stability to stress such as insect pests, disease, striga and drought and acceptable quality for local conditions and food preparation. The improvement of the crops is approached using small country-based multidisciplinary teams of from 2 to 10 scientists which make use of locally available and introduced germplasm and ensure incorporation of identified resistance sources from the international testing programmes. This work is often carried out in cooperation with scientists from national programmes. Funding for the project period amounts to US$ 3,180,000 from UNDP (Phase II) and US$ 500,000 from USAID for Mali, US$ 1,052,000 from OAU/SAFGRAD and two projects from IDRC amounting to US$ 697,341. Significant progress has been made in improvement of the two crops from both the breeding and agronomic points of view and it is hoped to continue to develop national, regional and international research aspects of the programme. There is considerable input into national research programmes by way of identification of scientists for training by ICRISAT.

1/ Letters and numbers refer to those in the tabulation.

9. Breeding of High Altitude Sorghum

This is the continuation of a project initiated many years ago under Mexican Government/Rockefeller Foundation programme, continued by IDRC and at the moment funded in an interregnum by ICRISAT. The programme is on the verge of releasing suitable material for use in the high altitude areas of Central America and is well on the way to producing white seeded cold tolerant sorghums. Recent work has also indicated that white seeded cultivars for use at lower elevations may have a potential in drought prone areas and that some lines are suitable for making tortillas. Some cultivars developed have been found to be of value in the high elevation areas of East Africa. Funding is being actively sought to continue the work for a further three years. The project is based at CIMMYT and makes use of facilities at headquarters and at research sites at various altitudes controlled by CIMMYT to advance suitable material.

10. Improvement of Chickpea

ICRISAT has a project based at a sister institute ICARDA which seeks to assist in improving the chickpea crops for the Middle, Near East and Africa. Two scientists are posted at Aleppo, both concerned with aspects of breeding of the crop. The programme receives and exchanges materials from the Indian sub-continent and particularly the ICRISAT core programme and is making significant progress in developing strains resistant to Ascochyta blight a major problem in most countries of the region. Cooperative trials with national programmes are conducted. The project is core funded.

E Collaborative Research Projects

E2 with Developed Countries

11. Centre for Overseas Pest Research, London

COPR and ICRISAT carry out a collaborative research project on the stem borer Chilo partellus. This involves field work at ICRISAT and laboratory studies in London on larval development and the chemical constituents of sorghum. Factors affecting the establishment of larvae and possible chemical antibiosis are being investigated. Local expenses for field work are met by ICRISAT core funds, travel and costs of laboratory studies are met by COPR. All work is "on-campus".

12. Max Plank Institute, Munich

Exploratory work has been carried out on insect attractants. A scheme is in preparation for submission for funding to GTZ which will enable the

chemical nature of plant resistance to insect in legumes to be studied. All work "on-campus".

13. Weed Research Organization, UK

Studies on strigol analogues, which cause germination of the plant parasite, striga have been carried out. Work is effected both on-campus and in Africa. Supplementary studies on striga establishment on sorghum and strain difference in striga have been carried out in UK. The cost of these projects is borne by IDRC and ODA. Sussex University is also involved in the striga analogue work.

14. Reading University, UK

A study on variability of the downy mildew pathogen is in progress, funded by ODA. Oospores are collected on-campus and at ICRISAT cooperating stations and sent to UK for study. Progress has been good. A scientist from UK has visited ICRISAT and was paid for from core funds.

A project in which vegetative material of groundnut is grown in UK after transfer of seed from USA is enabling rapid movement of useful germplasm into our programmes. This is core funded.

A further project on the photoperiod/temperature interaction of chickpeas is carried out in collaboration with the University of Reading. This is funded by ODA as a special project. ICRISAT provides accommodation and facilities for work for overseas scientists.

15. INIA, Mexico

Work has been initiated in collaboration with INIA on the tortilla making properties of sorghums arising from our breeding programme in Mexico. Physical and cooking characteristics are being examined. The Government of Mexico has provided $ 70,000 for this work. Useful results are being obtained.

16. University of Queensland, Australia

There is an important involvement with the University of Queensland on the breeding of short duration photosensitive pigeonpeas. This project is producing valuable results and is funded from the core budget.

17. North Carolina State University, USA

ICRISAT and North Carolina State University have recently initiated a project on biological nitrogen fixation in groundnuts. This is funded

currently by the USDA competitive grant scheme.

F Collection of Information and Data

18. ICRISAT hopes in the near future to mount a project on collection of socio-economic data at village level in West Africa. This is part of the overall programme of the economics programme in Africa which involves assistance to biological scientists in identifying viable technologies and evaluation of information to determine research strategies and consequences. This will be funded on restricted core. Additional information on anthropological aspects will be obtained from a special project supported by IDRC. Data of agroclimatological relevance is being obtained from countries in which ICRISAT works through core funded projects. Data on Niger have already been published and information from Brazil is being assembled so that climatological mapping can commence.

G Germplasm Collection, Maintenance, Preservation and Utilization

19. A representative and diverse germplasm collection is the cornerstone of breeding programmes. ICRISAT has acquired a large collection of germplasm of its five target crops and their wild relatives and is increasing its collection of minor millets. Regular collection trips are being mounted either in cooperation with organizations such as IBPGR, ORSTOM and IRAT or independently by the Centre. The aim is to preserve for posterity in long term storage,as wide a diversity as possible of germplasm which can be made readily available to research workers in national and regional programmes in the SAT. This is necessary since improved cultivars tend to replace old landraces, which contain genes which will be of use in the breeding programmes of the future. Information is recorded both on-campus and in off-campus sites on the characteristics of cultivars and dossiers are being built-up of useful stress resistant characteristics of material. The programme is mainly supported by core budget, but from time to time special project funds are used.

H Training and Follow-up

20. Programmes of "on the spot" training are being developed by ICRISAT scientists posted off-campus. Programmes on sorghum improvement have been conducted in Spanish, by the sorghum breeder at CIMMYT, Mexico, for Latin America. Similar programmes have been conducted for local staff and scientists in Mali in French and courses in Cereal Pathology have been initiated by the Cereal Pathologist based in Upper Volta. Activities are funded from both core and special project funds and a recent innovation has been the inclusion of post doctorate students (International Internship) in a cooperative programme in Africa, funded from core and special projects.

Special efforts are made by ICRISAT outposted staff and by scientists travelling from ICRISAT Center to maintain contacts with former trainees. Many are associated with national research projects and make direct use of information and material obtained from ICRISAT programmes. Training programmes are highly appreciated by students and their Governments and are a vital part of our efforts to strengthen research capability in national programmes.

I Consultations with National Programmes

ICRISAT does not operate a consultancy service per se. From time to time individual staff members have assisted national programmes for short periods in their particular specialist fields, e.g. research station development and research programme planning. Scientists and technicians, in the course of their duties regularly discuss research topics and problems with their colleagues in national programmes. Such interaction is fruitful and furtner strengthened by ICRISAT hosting and cosponsoring conferences, symposia and workshops in areas of ICRISAT's concern either on or "off-campus". ICRISAT scientists frequently attend, by invitation, national and regional research planning meetings, e.g. The All India Coordinated Research Programme meetings on sorghum, millets, pulses and groundnuts and the annual ISRA meetings on sorghum and millet research in Senegal. ICRISAT has been complimented on its participation in the CILSS regional research planning meetings and participates in regional research meetings under the OAU/SAFGRAD/ICRISAT agreements.

There are formal agreements between the Indian Council of Agricultural Research and ICRISAT on research and ICRISAT has "off-campus" activities at five sites in India under these agreements. Annual meetings are held in which ongoing research and results are discussed and future planning effected. Similar meetings are held under the various agreements concluded with national governments for ICRISAT's UNDP funded programme in Africa. Meetings are held at least annually in Senegal and Upper Volta.

Under the contractual terms agreed with UNDP an annual meeting UNDP/CIMMYT/ICRISAT is held in alternative years in Mexico or Hyderabad. In this results of UNDP funded programmes are evaluated and policy decisions on future course of action taken.

Table 2 :

ICRISAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Various	International Trials and Nurseries - Breeding, Entomology, Pathology - all mandate crops	A		c, sp		Continuous	
2. Senegal; Dakar	Project Coordination	B,C	1 Coordinator	sp	Salary + 492,000	Nov.78 Oct.81	IRAT salary + UNDP support
Senegal; Bambey	Research and training for the improvement of sorghums and millets	B,C	1 millet breeder, 1 entomologist	sp	502,000	Nov.78 Oct.81	UNDP
3. Upper Volta; Kamboinse	"	B,C,D	1 team leader/sorghum breeder	c	3,597,000	May 78 Dec.82	UNDP, SAFGRAD, IDRC
			1 striga physiologist/ breeder	rc			
			1 entomologist	sp			
			2 economists				
			1 agronomist				
			1 millet breeder				
			1 pathologist				
			(1 soil & water engineer) 1/				
			(1 social anthropologist) 2/				
			1 intern				

1/ Funded by SAFGRAD - 2/ Funded by IDRC

Table 2 :

ICRISAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
4. Niger ; Maradi	Research and training for the improvement of sorghums and millets	B,C	1 millet breeder	sp	265,000	Nov.78 Oct.81	UNDP
5. Nigeria; Samaru	"	B,C	1 millet breeder 1 pathologist (1 sorghum breeder) 1/ (1 entomologist) 1/ (1 production agronomist) 1/	sp	1,312,000	May 78 May 82	UNDP SAFGRAD
6. Sudan; Wad Medani	"	B,C	1 millet breeder 1 sorghum breeder	sp	500,000	Nov.78 Oct.81	UNDP
7. Tanzania; Ilonga	"	B,C	1 sorghum breeder	sp	-	Aug.80	USAID/ IITA
8. Mali; Bamako	"	B	1 sorghum/millet breeder 1 agronomist	sp	500,000	June 79 June 81	USAID
9. Mexico; CIMMYT	Breeding High Altitude sorghum	C,D	1 sorghum breeder	c			Sources to be identified

1/ Funded by SAFGRAD.

Table 2 :

ICRISAT Off-Campus Activities as of June 1980 /

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
10. Syria; ICARDA	Improvement of chickpea	C,D	1 chickpea breeder 1 geneticist	c	568,000	Jan.79	Dec.82	
11-17. U.K., Germany, Mexico, USA, Australia	Collaborative research	E2		c,sp				ODA, Mexico, COPR, IDRC, USDA
18. West Africa, Brazil	Collection of information and data	F		rc,sp c				IDRC
19.	Germplasm collection, preservation and utilization	G		c, sp				
20. Mali, Upper Volta, Mexico	Training in crop improvement	H	1 plant pathologist 1 breeder 1 agronomist (part-time)	c, sp			short courses	USAID, UNDP

Off-Campus Activities - ICARDA

Cereals

A International Testing

1. The Regional Wheat and Barley Nurseries and data feedback system provide a cooperative testing mechanism for national programmes and ICARDA, as well as a vehicle for dissemination of superior germplasm, allowing useful and adapted materials to become an integral part of the national programmes. For the 79-80 season around 900 nursery sets were distributed to national programmes (mostly in Middle East and North Africa) on specific request. They comprised a yield trial, an observation nursery, a crossing block, early generation segregating materials and a disease screening nursery each for barley, durum and breadwheat. ICARDA scientists visit some of the locations during the crop season. National programmes plant, record and select appropriate materials for further use and provide ICARDA with the field data.

B National Cooperative Projects

2. Jordan

A Ford Foundation grant of US$ 300,000 over a 2 year period has enabled ICARDA to participate in the Cooperative Winter Cereal Research and Demonstration/Production Programme in Jordan. ICARDA has stationed one cereal agronomist there. The purpose of this cooperative programme is to assist the Ministry of Agriculture and Faculty of Agriculture, University of Jordan, to identify higher yielding and better adapted wheat and barley varieties for Jordan, to work out appropriate production technologies and to carry out trials/demonstrations on farmer's fields that will introduce the varieties and technology to the Jordanian farmers in a way and on a scale, they can appreciate and adopt. The project is being extended for another two years.

3. Cyprus

A collaborative project between Agricultural Research Institute (ARI), Cyprus and ICARDA has enabled work on breeding and selection of short duration spring barley and durum wheat for areas with mild winters and short crop growing season, and agronomic aspects for such areas. ICARDA provides a grant of US$ 12,000 per year and no ICARDA staff are station in Cyprus for this project.

4. Syria

Since 1977 the ICARDA Cereal Improvement Programme and the Syrian National Programme have organized and conducted a series of verification trials on farmer's fields throughout Syria. These trials provide assessment of the yielding ability, stability of performance and disease reactions of most promising lines when cultivated in relatively large plots under field conditions with a suggested package of agronomic practices under various agro-climatic conditions. The project is funded from ICARDA's core budget. One junior scientist and two technicians are assigned for this project.

C Regional Programmes

5. Tunisia

ICARDA has posted one cereal scientist in Tunis to strengthen its research activities in North Africa, particularly Tunisia, Algeria and Morocco. He works closely with the national wheat and barley research workers in these countries in development and identification of varieties with necessary disease resistance and adaptability and pays particular attention to ICARDA's Regional Testing Programme. He has special responsibility to assist and strengthen Tunisian Barley Improvement Programme with special emphasis to drier areas. The project is supported from ICARDA's core budget.

6. Turkey

A collaborative high altitude winter cereal project is being negotiated between ICARDA and the Government of Turkey to improve wheat and barley production of winter habitat including related agronomy, training and communication aspects in the ICARDA region. A scientist has been selected for posting in Ankara. Initially the project is budgeted from ICARDA's core budget.

D Core Research outside Host Country

7. Jordan, Kenya

The Summer Nursery facility at Shawback, Jordan is provided by the Government of Jordan and allows the programme to advance early breeding lines by a generation during the "off season". ICARDA provides operating expenses. Promising advance lines are increased and screened for rust and other foliar diseases at the National Plant Breeding Institute, Njoro, Kenya. This facility is provided by Government of Kenya and CIMMYT.

G Germplasm Collection, Preservation and Utilization

8. ICARDA is developing barley and durum wheat collections, wild species of wheat and barley are being collected from the Middle East. IBPGR has posted a senior scientist who is cooperating in this project.

H Training, Visits and Workshops

ICARDA provides opportunities for young scientists to participate in its six months residential training course, as well as encourages senior scientists and administrators to pay short visits. Periodic workshops and conferences are organized to provide a forum for the exchange of information, research ideas and experiences.

I Consultation to National Programmes

ICARDA scientists, where possible visit the national programmes for consultation with cooperating researchers in the region and also to foster understanding and collaboration between cooperating scientists and create a team spirit in the region.

Food Legumes

The Food Legume Improvement Programme (FLIP) is working on three species; faba beans (Vicia faba), lentils (Lens culinaris) and chickpeas (Cicer arietium); the latter in cooperation with ICRISAT.

A International Testing

9. This is a major activity of FLIP and has the following objectives:

(a) To provide for the widespread dissemination of
- promising elite lines
- materials exhibiting special characteristics for further evaluation testing and hybridization
- early generation segregating populations for development under local conditions

(b) To allow the multi-location testing of elite material both to reduce the time necessary for evaluation prior to release and to allow the identification of genotypes having wide adaptability.

(c) To provide a mechanism for multi-location testing of materials having disease and pest resistance.

(d) To characterize and group the major environments in which the crops are grown.

(e) To encourage the development of information on agronomic management of these legumes in the region.

In the 1979/80 season 27 different trials were prepared; 10 faba bean, 9 lentil and 8 chickpea. A total of 594 sets of these trials were distributed to 34 different countries.

The trials include materials developed by national programmes, as well as by FLIP. Special trials to evaluate Ascochyta blight resistance (chickpeas and faba beans), Orobanche resistance (faba beans) and winter hardiness (chickpeas) have been developed.

C Regional Programmes

10. The most important off-campus research programme of FLIP is the special project "Applied Research on Faba Beans in the Nile Valley". This is a cooperative project between ICARDA, and the national programmes in Egypt and Sudan. It is funded by International Fund for Agricultural Development, IFAD, and amounts to approximately $ 1,000,000 annually. The project provides funding for the development of staff and research facilities in the national programmes and also aims to create a multi-disciplinary approach to faba bean improvement through the involvement of a large number of national scientists, from various disciplines, in a series of trials conducted on farmers' fields. Although these trials form the focal point of the project, a number of topics have been identified requiring greater in-depth research on the Experiment Stations. Specific research on such topics is contracted with individual scientists. In addition to field trials and surveys, the project aims to strengthen the national programmes through the provision of equipment and other facilities, training (both in-service and higher degree training) and information exchange through meetings, conferences and literature.

A senior ICARDA administrative officer is stationed in Cairo to coordinate the project. The technical and much of the administrative work is handled by national programme scientists in collaboration with ICARDA staff in Cairo, Beirut and Aleppo.

D Core Research Programmes outside the Host Countries

11. Jordan

Summer off-season research work is carried out from June to October at

high altitude research station at Shawbak in Jordan in cooperation with the national research programme of the Jordanian Government, Ministry of Agriculture. The main activities undertaken include generation advance, seed multiplication and some hybridization.

12. Turkey

Research on food legumes under high altitude conditions is being conducted in cooperation with the national programme in Turkey. It is planned to employ a senior scientist to lead this research in the near future.

E Collaborative Research Projects

E1 With developing Countries

13-22. A number of research projects on food legumes have been set up in cooperation with various national programmes in the region. These projects are all funded by IDRC, who make the grants directly to the national programmes. Although no resident expatriate research staff is stationed by ICARDA in the countries concerned, technical input is provided in the original drafting of the proposals, monitoring the progress of the projects through exchange visits, consultancies, etc., training, and through the provision of germplasm and other genetic materials.

Such cooperative research projects have been established in 9 countries Algeria, Sudan, Egypt, Lebanon, Syria, Jordan, Turkey, Pakistan and Bangladesh

The research on chickpeas at ICARDA is a collaborative effort between ICARDA and ICRISAT, with both institutions contributing financially and technically to the research.

E2 With developed Countries

23. A collaborative project on Ascochyta blight resistance in faba beans between ICARDA and the University of Manitoba, Canada is funded by IDRC.

24-25. Two collaborative projects have been established between ICARDA and the Institute for Plant Protection, University of Bonn. One project is on Ascochyta blight in chickpeas and is financed by DAAD 1/. The other project,

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1/ Deutscher Akademischer Austauschdienst

funded by GTZ, is on aphids in Faba beans. Both projects involve research by Ph.D. students at ICARDA, Aleppo. Technical supervision and some back-up research is conducted in Bonn. Collaboration, particularly through the provision of consultants, has also been established between ICARDA and various German institutions, through funding from GTZ in the areas of lentil mechanization, pest surveys and seed production in Egypt.

26. An informal collaborative project on the mineral nutrition of lentil and chickpeas has been established with the University of Hohenheim, West Germany.

27. The FLIP microbiology programme collaborates with the International Atomic Energy Agency (IAEA) programme in its international project on the quantification of symbiotic nitrogen fixation in legumes.

H Training

28. In addition to the two Ph.D. students mentioned under 24-25., there is a collaborative programme with the University of Aleppo through which two students are studying for their MSc degrees at ICARDA. This scheme is sponsored by Ford Foundation. FLIP staff have also been involved with teaching on this MSc course. A third MSc student, registered at Wye College, University of London is also conducting his research at ICARDA, funded by Ford Foundation.

Table 3 :

ICARDA Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From	To
	CEREALS							
1.		Regional Wheat & Barley Testing	A					
2.	Jordan	Cooperative Winter Cereal Research & Demonstration/ Production Programme	B	1 Cereal Agronomist	sp	300,000	2 years	Ford Foundation
3.	Cyprus	Collaborative Cereal Improvement Programme	B,E1		c	12,000/p.a.		
4.	Syria	Farmer's Field Verification Trial	B		c		1977 -	
5.	Tunisia	North Africa Research Programme	C,A,B	1 Cereal Scientist	c			
6.	Turkey	Collaborative High Altitude Winter Cereal Project	C,D	1 Breeder	c			
7.	Jordan; Shawback Kenya; Njoro	Summer Nursery Facility	D					

Table 3 :

ICARDA Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
8.	Syria Lebanon	Germplasm Collection, Preservation & Utilization	G					
	FOOD LEGUMES							
9.		International Testing Programme	A					
10.	Egypt/Sudan	Nile Valley Project Applied Research on Faba Beans	C	1 Admin. Officer	sp	3,000,000	3 years	IFAD
11.	Jordan	Summer Off-season Research (Lentil, Faba Beans)	D		c			
12.	Turkey	High Altitude Food Legume Research (Chickpea, Lentil)	D,C		c			
13.	Algeria	Grain Legume Research	E1,H,I		sp	197,300	3 years	IDRC
14.	Sudan	Food Legume Improvement	E1,H,I		sp	210,200	3 years	IDRC
15.	Egypt	" " "	E1,H,I		sp	243,800	3 years	IDRC

Table 3 :

ICARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
16. Lebanon; Amer.Univ.Beirut	Orobanche Control	E1	sp		106,000	3 years	IDRC
17. Lebanon; Amer.Univ.Beirut	Food from Grains	E1	sp		127,000	3 years	IDRC
18. Syria	Crop Intensification	E1, H,I	sp		242,000	3 years	IDRC
19. Jordan; Univ.of Jordan	Food Legume Improvement (Chickpea, Lentil)	E1	sp				IDRC
20. Turkey	Food Legume Improvement	E1,H,I	sp		255,000	3 years	IDRC
21. Pakistan	" " "	E1,H,I	sp		376,000	3 years	IDRC
22. Bangladesh	" " "	E1,H,I	sp		220,000	3 years	IDRC
23. Canada; Univ. Manitoba	Ascochyta blight in Faba Beans	E2	sp				IDRC
24. Germany; Univ. Bonn	Ascochyta blight in Chickpeas	E2	sp				DAAD

Table 3 :

ICARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
25. Germany; Univ. Bonn	Aphids on Faba Beans	E2		sp			GTZ
26. Germany; Univ. Hohenheim	Mineral Nutrition of Lentil and Chickpea	E2		sp			
27. Austria; IAEA	Nitrogen Fixation by leguminous Crops	E2		sp			
28. Syria; Univ. Aleppo	MSc. Training Food Legumes	H		sp			Ford Foundation

Off-Campus Activities - ILCA

In the case of ILCA, the distinction between on- and off-campus activities is more difficult than in other centres. ILCA's mandate - the study and improvement of livestock production systems in Africa - necessitates a decentralization of its programme according to ecological zones, as these are the main determinants of the production systems. The main field programmes are here described under the heading of regional programmes, although they could well be regarded as on-campus activities.

A International Testing

1. Comparison of Livestock Breeds

Over the years ILCA has assisted national authorities in the analysis of data on the performance of different livestock breeds. Breeds covered include the Maure and Peuhl breeds of the Sahel, and the Sahiwal in Kenya. For 1980 a comparative study on the Boran is planned.

2. Studies on the Use and Potential of Trypanotolerant Breeds

This study is differentiated from A 1. because of its scope, design and detail (involving data collection as well as analysis). After a first phase with FAO and UNEP, which reviewed the state of knowledge on the use and potential of trypanotolerant livestock, ILCA is now establishing a network, which will study the interaction between breed, tsetse challenge and management system, in order to promote a more rational use of the trypanotolerant livestock population of the humid areas. Core budget allocation in 1980 is US$ 171,000 whilst a contribution of US$ 333,000 is expected from the Belgian Government for the Zairian component. Further contributions are envisaged in 1980 in Ivory Coast.

B National Cooperative Projects
(see also E Collaborative Research Projects)

3. Ethiopia

The Government of Ethiopia is contributing in 1980 US$ 60,000 for ILCA's help in the establishment of development monitoring for its Rangeland Development Programme. ILCA is contributing US$ 100,000 from its core funds

for the operating costs.

4. Botswana

Similarly the Government of Botswana is expected to contribute with the operating costs for the establishment of monitoring procedures for its second livestock development project, whilst ILCA will contribute with the secondment to the Botswanan Government of one senior scientist.

5. Kenya

It is expected also that the Kenyan Government will contribute, start-up date uncertain, with US$ 100,000 for monitoring in its second livestock development project.

The above activities can also be classified, with 11. below, as monitoring.

6. Mali

The Belgian Government has expressed interest in funding the special project which would expand ILCA's research in the sedentary millet-livestock system. Provisionally US$ 152,000 is allocated to this special project in 1980.

C, D Regional Programmes and Core Research outside Host Country

As mentioned before, ILCA's main research thrust is on regional programmes differentiated according to ecological zones. They are all funded from the core budget and are as follows:

7. Arid Zones Research

A total of US$ 798,000 and 6.5 senior scientific man-years are allocated in 1980 to ILCA's Arid Zones Research in Mali. The main lines of research are (a) the improvement of fodder production and its quality in the sedentary production systems, and (b) the development of socio and territorial units, and the improvement of livestock nutrition in the framework of such units, in migratory systems.

8. Subhumid Zones Research

US$ 642,000 and 5.6 senior man-years are allocated in 1980 to ILCA's research in the subhumid zone, which is centred around Kaduna in Nigeria. Its main focus is on the improvement of dry season quality of livestock nutrition in the sedentarized Fulani system.

9. Humid Zones Research

Around Ibadan, Nigeria, ILCA's Humid Zones Research team (allocated US$ 657,000 and 5.5 senior man-years in 1980) is developing small ruminant production systems for village conditions. The utilization of exisiting fallow land stands central in the approach, whereby improved productivity is sought through alleviating disease and nutritional constraints.

10. Highlands Research

Although physically located in the host country, ILCA's Highland Research falls in the same category of Regional Programmes. Its main aim is a better integration of livstock and cropping in small holder subsistence systems. This is being obtained through the introduction of forages in the cropping systems and the genetic improvement of cattle for milk production and traction. US$ 704,000 and 6.5 man-years of senior scientific staff have been allocated to this component of ILCA's field research in 1980.

11. Studies in Livestock Development Schemes

ILCA has a central team located in Kenya developing a methodology which will assist in the determination of the factors which affect livestock development schemes. As this methodology has regional relevance, it is classified in this category. US$ 549,000 and 4.1 man-years are allocated in 1980 to this activity.

E Collaborative Research Projects

E1 With Developing Countries

12. Mali

Negotiations with the Malian Government are almost concluded for the application of ILCA's methodology in the definition of social territorial limits in the Inner Delta of the Niger. The Malian Government will contribute to ILCA for this special project US$ 600,000 over a two-year period starting in October 1980.

13. Africa

IDRC is contributing to a documentation team which collects non-conventional literature on livestock production at African libraries and research institutes. Countries covered in 1980 under this special project

are Nigeria, Cameroon, Tanzania and Ethiopia. IDRC's contribution is US$ 64,000 in 1980.

E2 With Developed Countries

14. ILCA cooperates with the University of Hohenheim, West Germany, in the development of a farm planning model for the small-holders system in its highland research. ILCA has allocated US$ 20,000 core funds, whereas the contribution of the University is valued at approximately the same level.

15. A similar cooperation exists between the National Institute of Agricultural Engineering of the U.K. in the field of animal traction in ILCA's highland research.

H Training

The non-availability of training facilities has constrained ILCA's training activities in the past. Nevertheless a total of 10 fellows are presently working in ILCA's field research programme, and it is expected that next year approximately 70 African scientists and development personnel will undergo formal training at ILCA.

I Consultation to National Programmes

Apart from its active cooperation with national programmes in its livestock development monitoring activities (see 3., 4. and 5.) ILCA has no formal agreements with governments for consultations. However, if possible within their work plan, it encourages scientists to participate in consultancy missions of international technical assistance organizations, as it sees those consultations as an effective way to extend its research and development methodologies.

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
1. Africa	Comparison Livestock Breeds	A	Animal Geneticist	c	82,000			
2. W.Africa (Zaire and Ivory Coast)	Trypanotolerance Network	A	1 Animal Scientist 1 Economist	c,sp	504,000	Oct.80	Oct.83	Belgium
3. Ethiopia	Livestock Project Monitoring	B	1 Socio-Economist	c,sp	160,000	Apr.80	Apr.83	Ethiopia
4. Botswana	" " "	B	1 Economist	c,sp	153,000	Jul.80	Jul.83	Botswana
5. Kenya	" " "	B	-	sp	100,000	Oct.80		Kenya
6. Mali; Niono	Forage Introduction Sedentary Millet System	B	1 Agronomist 1 Animal Nutritionist	sp	152,000	Oct.80		Belgium
7. Mali; Niono	Arid Zones Research	C,D	2 Agronomists 2 Animal Scientists 1 Socio-Economist 1 Ecologist 1 Animal Nutritionist	c	789,000			
8. Nigeria; Kaduna	Subhumid Zones Research	C,D	1 Economist 1 Ecologist 2 Animal Scientists 1 Sociologist 1 Animal Nutritionist	c	642,000			

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
9. Nigeria; Ibadan	Humid Zones Research	C,D	1 Veterinarian 1 Animal Scientist 1 Animal Nutritionist 1 Forage Agronomist 2 Veterinarians 1 Economist	c	657,000			
10. Ethiopia; Debre Zeit and Debre Berhan	Highlands Research	C	2 Animal Scientists 1 Forage Agronomist 1 Economist 3 Farm Management Spec.	c	704,000			
11. Kenya	Studies Development Schemes	C,D	2 Animal Scientists 2 Ecologists 1 Economist 1 Sociologist	c	549,000			
12. Mali	Application Social Territorial Organization	E1	1 Ecologist 2 Sociologists 1 Animal Scientist 1 Geographer	sp	600,000 (2 years)	Oct.80	Oct.82	Mali/IDA

Table 4 :

ILCA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
13. Africa	Documentation Collection	E1		sp	64,000	Apr.79	Apr.81	IDRC
14. West Germany; Univ. Hohenheim	Farm Planning Model	E2		c	20,000	May 79	May 81	
15. United Kingdom; NIAE	Animal Traction	E2		c,sp	10,000			NIAE

Off-Campus Activities - IITA

A International Testing

1. IITA has an established international testing programme for cowpeas. In 1979, 189 trial sets were sent to 48 countries. Included in this programme are yield trials, disease resistance nurseries and intercropping trials. Within Africa, IITA promotes regional maize and cowpea trials through its involvement in the SAFGRAD Project (see 11 below) and a number of African countries are participating in sweet potato and cassava testing programmes.

B National Cooperative Projects

2. Sierra Leone

Since 1974, IITA has been under subcontract with FAO to execute a UNDP funded project aimed at strengthening rice research in Sierra Leone. Under the present phase of the subcontract which expires 31 December 1980, IITA has had a team of three scientists; a pathologist, an agronomist, and an extension agronomist, undertaking a number of agronomic experiments, performing a series of studies of rice disease problems and executing a programme of on farm trials of improved packages of rice technology.

3. Ghana

In June 1979, IITA entered into a contract with USAID calling for IITA to place two scientists at Atebubu in Central Ghana to undertake studies aimed at improving food crop farming systems in the region. The two scientists are an agronomist and a land management systems agronomist.

4. Upper Volta

A grant from IDRC has enabled IITA to place since 1977, a plant breeder in Ouagadougou to assist the Government of Upper Volta develop its National Cowpea Improvement Program.

5. Nigeria

IITA has been participating in the National Accelerated Food Production Project (NAFPP) since 1974, first under a grant from USAID and since July 1977 under a grant from the Nigerian Government. Under the Nigerian Government grant, eight IITA scientists were involved in supporting various aspects of the NAFPP. At the present time (August 1980), one IITA staff member, a communications specialist, remains and will serve under NAFPP till 31 December 1980.

6. Cameroon

IITA is involved in two projects in Cameroon, the Cameroon National Root Crops Improvement Program (CNRCIP) and the ZAPI-Est Farming Systems Research Project. Funds from the Belgian Government and the IDRC enable IITA to provide two agricultural advisers, a plant breeder and an agronomist, to the CNRCIP which focuses on cassava, sweet potato, yam and cocoyam improvement. An IITA agronomist is stationed in Easter Cameroon under the IBRD funded ZAPI-Est Project to develop over a three year period a long term plan for food crops research in the area.

IITA is presently negotiating its participation under a grant from USAID in the Cameroon National Cereals Research and Extension (NCRE) Project. NCRE would cover maize, rice, sorghum and millet. IITA would seek ICRISAT's participation in the sorghum and millet aspects of NCRE.

7. Zaire

Since 1974, IITA has been assisting the Government of Zaire develop its national cassava programme, Programme National Manioc (PRONAM), first under a contract with the Zairian Government and since May 1980 under a contract with USAID. With USAID support IITA is to provide a team of eight; an agronomist, a plant breeder, an entomologist, two extension agronomists, a training officer, a physical plant services officer and an administrator.

8. Tanzania

IITA and, through subcontractual arrangements, CIMMYT and ICRISAT are involved in strengthening food crops research in Tanzania. IITA is providing a project leader, an agricultural economist and a team consisting of a plant breeder and an agronomist to work on grain legumes. CIMMYT is providing a plant breeder and an agronomist for maize improvement and ICRISAT is providing a plant breeder to work on sorghum.

9. Sao Tome

IITA is assisting the Republic of Sao Tome and Principe (RSTP) establish a national food crop trials programme involving rice, maize and grain legumes. IITA does not have a full time scientist assigned to RSTP, rather two Sao Tomeans have received concentrated training in establishing and evaluating food crop trials and IITA scientists make several trips per year to Sao Tome to guide and evaluate the effort which is funded under a contract with USAID.

10 Sri Lanka

An IITA agricultural engineer is assigned to Sri Lanka to develop an agricultural engineering programme focussed on developing small tools and machinery for low resource food crop farmers in the tropics. Although part

of a national effort, tools and machinery developed would be relevant to food crop farming systems throughout the tropics.

C Regional Programmes

11. SAFGRAD

Under a contract with USAID, IITA is providing four scientists to participate in the Semi-Arid Food Grains Research and Development (SAFGRAD) Project. The scientists, all based in Ouagadougou, are a maize breeder, a maize agronomist, a cowpea agronomist and an entomologist. The cowpea agronomist works closely with the IITA cowpea breeder assigned to the Upper Volta National Cowpea Improvement Programme. There are twenty-four African countries participating in the SAFGRAD effort.

D Core Research Programmes Outside the Host Country

12. Brazil

An IITA plant breeder has been assigned to assist the Brazilian Government develop a national cowpea improvement programme. This scientist has been assigned to the Empresa Brasileira de Pesguisa Agropecuaria (EMBRAPA) agricultural research station at Goiânia. The rationale for locating this core activity in Brazil stems from the fact that outside Nigeria, Brazil is the world's largest producer of cowpeas, one of the crops for which IITA has a world wide mandate.

E Collaborative Research Projects

E1 With Developing Countries

13. Niger

Under a grant from IDRC, IITA is undertaking in collaboration with the Institut National de Recherches Agronomiques (INRAN) of Niger a study of drought tolerance in cowpea. A core supported IITA post-doctoral fellow is assigned to this study.

14. Brazil

IITA has entered into an agreement with EMBRAPA whereby the two institutes collaborate on land development and soil management research, EMBRAPA is responsible for covering costs which can be paid in Brazilian currency, IITA covers other costs from its core budget. No full time IITA scientist is assigned to this project.

15. Kenya

IITA and the International Centre on Insect Physiology and Ecology (ICIPE) in Kenya are collaborating on research into a major insect pest of cowpea, Maruca testulatis. IITA is supporting this collaboration, which does not involve a full time staff position, with its core funds.

16. Ghana

IITA is collaborating with scientists of the Ghanaian Grains Development Board and the resident CIMMYT maize scientist on a programme of cowpea improvement research. No full time IITA scientist is assigned to this effort which is funded under a grant from the Canadian Government to CIMMYT.

E2 With Developed Countries

17. USA: The Boyce Thompson Institute (BTI) and Cornell University

A grant from UNDP supports collaboration between IITA, BTI and Cornell University scientists working on nitrogen fixation in cowpea and soybean. This collaboration does not involve the assignment of IITA scientists to off-campus locations.

18. Australia: The University of Western Australia

Funds provided to IITA by UNDP for studies of nitrogen fixation enable IITA to support a postdoctoral fellow at the University of Western Australia investigating nodulated cowpea lines for variation in post anthesis performance.

19. Netherlands

IITA has entered into an agreement with Dutch Research Institute for Plant Protection whereby the two Institutes collaborate on research into virus diseases of tropical food crops. IITA is supporting this collaboration with core funds.

20. Belgium

With support from the AGCD of Belgium, IITA has entered into agreements for collaborative research with the following Belgian universities for the areas indicated:

Gembloux	Grain legume research
Louvain	Cassava disease studies
Gent	Pedology
Leuven	Plantain research

G Germplasm Collection, Preservation and Utilization

21. The collection and evaluation of rice, food legumes and root crop germplasm are the major objectives of IITA's Genetic Resources Unit (GRU). Material from these collections are made available to collaborating scientists, to national programmes and to genetic resource centres of other agricultural research institutes. The GRU is largely supported from core fund; however, special grants have been made available by the International Board for Plant Genetic Resources for certain facilities and for training Africans in genetic resources conservation.

H Training and Follow-up

22. Research Fellows (Ph.D. level), Research Scholars (M.Sc. level), Vacation Student Research Scholars (final year undergraduates) and participants in the seven to ten courses offered at IITA every year number around 300. Seventy of these are registered for graduate degrees in 15 universities of seven countries of three continents. Approximately 20 are registered at the neighbouring University of Ibadan. Vacation Student Research Scholars number as many as 20 every year. The rest are participants of group courses of varying lengths covering the areas for which IITA's mandate has made it responsible among the International Agricultural Research Centres, including soil and plant analysis, soil microbiology, soil and water conservation research, genetic resources conservation, post harvest engineering, and grain legumes, root crops and maize and rice production courses. Most courses are conducted in both English and French.

Current addresses are kept for all of IITA's Training alumni, who receive the IITA Newsletter and various publications. Continuing contact is maintained not only through the printed word but also through visits arranged during staff travel and during conferences and workshops.

I Consultation with National Programmes

23. IITA carries on continuing consultations with national agricultural research programmes and often sends scientists to visit such programmes. In addition, IITA often invites scientists from national programmes to visit IITA's headquarters site and to participate in the numerous conferences and workshops hosted by the Institute. As is consistent with IITA's mandate, the focus of these consultation visits is on African national programmes.

Table 5 :

IITA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
1.	International Testing	A		c				
2. Sierra Leone	Rice Research, technology transfer (t.t.)	B	1 Pathologist 1 Agronomist + (1 Extension Agron.)	sp	646,000	1.1.78	31.12.80	UNDP/FAO
3. Ghana	Farming Systems Research t.t.	B	1 Agronomist 1 Land Man. Syst.Agron.	sp	906,000	25.6.79	31.12.82	USAID
4. Upper Volta	Cowpea research, t.t.	B	1 Breeder	sp	340,000	25.8.77	31. 5.81	IDRC
5. Nigeria	Strengthen national programme	B	1 Communic. Spec.	sp	1,317,000	1.7.77	31.12.80	Nigeria
6. Cameroon	Root crops research, t.t.	B	1 Breeder	sp	410,000	1.4.77	30. 9.83	IDRC
			1 Agronomist		750,000	1.10.77	30. 9.82	Belgium
"	Farming systems research, t.t.	B	1 Agronomist	sp	402,000	1.9.78	30. 6.83	World Bank
7. Zaire	Cassava research, t.t.	B	1 Agronomist 1 Breeder 1 Entomologist + (2 Exten. Agron. 1 Training Off. 1 Phys.Plant Serv. Off. 1 Admin Off.)	sp	3,113,000	1,5.80	30. 4.84	USAID

Table 5 :

IITA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
8. Tanzania	Maize, grain legume, sorghum research, t.t.	B	1 Project Leader 1 Agric. Econ. 1 Breeder 1 Agronomist	sp	3,010,000	1.11.76	30. 9.80	USAID
9. Sao Tome	Technology transfer	B		sp	43,000	8. 5.78	7.11.80	USAID
10. Sri Lanka	Agric. engineering research, t.t.	B,C	1 Agric. Engin.	sp	475,000	7.12.79	6.12.82	Ciba Geigy
11. SAFGRAD	Maize, cowpea research,t.t.	C	1 Breeder 2 Agronomists 1 Entomologist	sp	1,326,000	8. 3.78	7. 3.81	USAID
12. Brazil	Cowpea research, t.t.	D	1 Breeder	c				
13. Niger	Cowpea drought tolerance research	E1	1 Post. Doc.	sp, c	52,000	5. 2.80	4. 2.82	IDRC
14. Brazil	Land preparation, soil management research	E1		c				
15. Kenya	Cowpea insect pest research	E1		c				
16. Ghana	Cowpea research, t.t.	E1		sp	60,000	10.11.77	9.11.83	CIDA/CIMMYT

Table 5 :

IITA Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From	To	
17.	USA; BTI & Cornell	Grain legume nitrogen fixation research	E2		sp	880,00	7. 2.69	6. 2.84	UNDP
18.	Australia; Univ. W.Aust.	Grain legume nitrogen fixation research	E2		sp	56,000	1. 2.80	31. 1.82	UNDP
19.	Netherlands	Virus disease research	E2		c				
20.	Belgium	Collaborative research	E2		sp	240,000	annual grant		Belgium
21.		Germplasm activities	G		c				
22.		Training and follow-up	H		c				
23.		Consultations to national programmes	I		c				

Off-Campus Activities - WARDA

WARDA is an Association of 15 countries in West Africa with the mandate to promote steps for increasing the quantity and improving the quality of rice produced locally. As such, a substantial part of WARDA's activities is located off-campus and distributed so as to cater for geographical as well as ecological coverage.

A International Testing

1. This is the most extensive of WARDA's off-campus activities. In 1980, as for past years, some 225 sets of seeds and chemicals have been distributed to some 61 sites throughout the region. These include three types of initial evaluation tests based on ecology; 12 types of coordinated variety trials based on ecology and duration; and two types of crop protection trials based on ecology. The varietal testing programmes include materials introduced from IRRI, IITA, CIAT, IRAT and national programmes in Asia, South America and West Africa. The main purpose of these tests is to identify varieties which are well adapted to the different ecologies that exist in the region. National programmes also gain access to excellent breeding materials from these tests. Direct cost of these trials in 1980 is estimated at US$ 197,000 and is funded from core budget. Supervision and surveillance of these trials is done by WARDA's Sub-Regional Coordinators.

B National Cooperative Projects

WARDA's activities in this area consist of core funded support of national research capabilities. These activities include direct technical support, backstopping consultations and visits by the Sub-Regional Coordinators, staff of Special Research Projects as well as technical staff from headquarters. Although these are regular activities involving all technical staff of the association they are not specified under any particular budget item.

C Regional Programmes

WARDA has posted a Sub-Regional Coordinator and an Assistant to a central location in each of its five sub-regions as follows:

2. Gambia, Senegal, Guinea Bissau and Mauritania; stationed in Gambia.

3. Guinea, Sierra Leone and Liberia; stationed in Guinea.

4. Upper Volta, Ivory Coast and Mali; stationed in Upper Volta.

5. Ghana and Nigeria; stationed in Ghana.

6. Niger, Togo and Benin; stationed in Niger.

Geographic, as well as linguistic considerations were determining factors in these groupings so as to facilitate communication and easy operations. The duties of these Sub-Regional Coordinators include supervision and surveillance of WARDA's network of trials. They maintain close contacts with Governments and rice scientists in their respecitve countries of operation and effect liaison between national programmes and WARDA's special Research Projects, as well as staff at headquarters. They are supported from core budget. Total budget for these operations in 1980 amount to US$ 678,000.

D Core Research Programmes outside the Host Country

WARDA's special research projects for irrigated, rainfed, deep flooded/floating and mangrove rice are ecologically placed. They are usually located side by side with the strongest national programme in that ecology. These locations also turn out to be where the particular type of rice cultivation is of major importance. These special research projects are distributed as follows:

7. Special Research Project for irrigated rice; located at Richard-Toll/Fanaye, Senegal and funded by IDRC and Belgium. Total budget for 1980 is US$ 186,000.

8. Special Research Project for mangrove rice; located at Rokupr, Sierra Leone and funded by USAID and ODA. Total budget for 1980 is US$ 495,500.

9. Special Research Project for upland rice; located at Bouake, Ivory Coast and supported by France, which is providing US$ 120,000 in 1980 for the project. Because of the importance of rainfed rice in the region, this project needs much expansion. A comprehensive five year plan for this project requires $ 2,379,130, $ 1,703,030, $ 1,681,425, $ 1,176,050 and $ 975,035 for 1980 through 1984 respectively. Funds are being sought from bilateral sources.

10. Special Research Project for deep flooded and floating rice; located at Mopti, Mali and funded by USAID. Total budget for 1980 is US$ 298,900.

E Collaborative Research Projects

E2 With Developed Countries/Institutions

11. Catholic University Louvain-la-Neuve, Belgium

Under a Government of Belgium grant averaging about US$ 120,000 per annum (1980-84), WARDA scientists in Senegal, Sierra Leone and Liberia in collaboration with staff of the Catholic University in Belgium have embarked on research on azolla and its use in lowland rice culture in West Africa. One WARDA staff is situated in Richard Toll, Senegal following intensive training in Belgium and is responsible for coordinating such research throughout the region.

12. ICIPE

WARDA is yet to initiate its part of an ICIPE/WARDA cooperative programme on lepidopterous rice stemborers. WARDA's part in the programme has been budgetted as $ 161,350, $122,350 and $105,350 respectively for 1980, 1981 and 1982. Work will start as soon as donor support is available; it is expected that EEC may accept to fund this project.

F Collection of Information and Data

13. WARDA engages in collaborative on-farm research with scientists in all member countries except Nigeria. The main idea is to identify constraints to production and collection of base line data and information so as to evolve means of bridging the gap between research results and production levels. A large part of this research is done through on-farm trials which also serve in assessment of performance. These programmes are coordinated by the Sub-Regional Coordinators. Total budget for these trials is US$ 75,000 in 1980 and is core funded.

14. WARDA conducts disease and pest monitoring tours in the region. Institutions such as IRRI, IITA and IRAT as well as national scientists have contributed to these tours and costs to WARDA have been negligible.

G Germplasm Collection, Preservation and Utilization

15. WARDA collaborates with IITA and IRAT-ORSTOM in this activity. WARDA's planned activities for 1980 cost $ 45,000.

I Consultation to National Programmes

WARDA has no formal, scheduled programme of consultation to national programmes. However, its scientists maintain contact with national programmes through frequent visits and correspondence.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
1. West Africa	International Rice Testing Program	A		c	197,000 p.a.		
2. Gambia	Sub-Regional Coordination - Gambia, Senegal, Guinea Bissau, Mauritania	C	1 Agronomist 1 Asst. Agron.	c	678,000 p.a.		
3. Guinea	Sub-Regional Coordination - Guinea, Sierra Leone, Liberia	C	(1 Agronomist) 1 Asst. Agron.	c			
4. Upper Volta	Sub-Regional Coordination - Upper Volta, Mali, Ivory Coast	C	1 Agronomist 1 Asst. Agron.	c			
5. Ghana	Sub-Regional Coordination - Chana, Nigeria	C	1 Agronomist 1 Asst. Agron.	c			
6. Niger	Sub-Regional Coordination - Niger, Togo, Benin	C	1 Agronomist 1 Asst. Agron.	c			
7. Senegal; Richard Toll/ Fanaye	Research Project - Irrigated Rice	D,C	1 Soil Scientist/ /Team leader + (1 Breeder 1 Entomologist 1 Weed Sc. 1 Agronomist)	c,sp	186,000 p.a.		IDRC, CIDA Belgium

1/Staff in parenthesis not yet in position.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff [1/]	Funding			Donors
				Type	Amount $	Duration From To	
8. Sierra Leone; Rokupr	Research Project - Mangrove Rice	D, C	1 Breeder 1 Soil Scientist 1 Entomologist + (1 Pathologist, 1 Weed Sc., 1 Agronomist)	c, sp	495,500 p.a.		USAID, ODA
9. Ivory Coast; Bouaké	Research Project - Upland Rice	D, C	1 Asst. Breeder + (1 Team Leader, 1 Breeder 1 Pathologist, 1 Entomologist 1 Climatologist 1 Soil Scient. 1 Weed Scient. 1 Agronomist)	c, sp	120,000 [2/] p.a.		France
10. Mali; Mopti	Research Project - Deep Flooded and Floating Rice	D, C	1 Agronomist + (1 Breeder 1 Weed Scient. 1 Entomologist 1 Team Leader)	c, sp	299,000 p.a.		USAID

1/ Staff in parenthesis not yet in position - 2/ Subject to change.

Table 6 :

WARDA Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
11. West Africa/ Belgium	Collaborative Research on Azolla and its use in Lowland Rice	E2		sp	120,000 p.a.		Belgium
12. West Africa/ ICIPE	Collaborative Research on Lepidopterous Rice Stem Borers with ICIPE	E2		sp	3/		EEC (?)
13. West Africa	On-Farm Research	F, E1		c	75,000 p.a.		
14. West Africa	Disease and Pest Monitoring	F		c			
15. West Africa	Germplasm Collection, Preservation and Utilization	G		c	45,000 p.a.		

1/ Staff in parenthesis not yet in position.

2/ Funds not available yet.

Off-Campus Activities - IBPGR

B National Programmes

1. The IBPGR has continued to help to build up national programmes in countries where important genetic diversity exists.

C Regional Programmes

The major regional efforts supported by the Board are:

2. Southeast Asia

The countries in Southeast Asia (Indonesia, Malaysia, Papua New Guinea, the Philippines and Thailand) established a regional cooperative programme for genetic resources activities in 1976. A regional genetic resources officer was appointed in mid-1979 stationed in Bangkok.

3. Mediterranean

Since 1980, the Germplasm Laboratory of the Italian National Research Council at Bari, Italy, has been coordinating the collection and conservation of germplasm in the Mediterranean countries.

4. Southwest Asia

To implement the IBPGR programme in the countries of Southwest Asian region, an officer has been posted to ICARDA headquarters at Aleppo, Syria. This officer will also act as a catalyst for the emerging ICARDA genetic resources programme.

E Collaborative Research Projects

E2 With Developed Countries

5. The University of Reading, UK

The Board is supporting research work on seed physiology related to storage conditions.

6. CSIRO, Canberra, Australia

Studies on long-term storage of grapes in vitro ($21,063).

7. The Royal Tropical Institute, Amsterdam, The Netherlands

Studies on genetic resources of tropical and sub-tropical fruits and nuts ($74,460).

G Germplasm Collection, Preservation and Utilization

8. Latin America

Collection of Arachis germplasm in South America. Brazil, Argentina, Peru and Bolivia - ongoing since 1976.

9. Uruguay

Collection of forage grasses and legumes germplasm - ongoing since 1978 ($25,000).

10. Brazil

Collection of maize germplasm in the Amazon region (CENARGEN/EMBRAPA). Maintenance of living collection of Arachis sp.

11. Colombia (CIAT)

Coordination of Phaseolus germplasm collection in Latin America.

12. Peru

Collection of maize germplasm in the Selva region and Lycopersicon in the Marañon Valley. Evaluation of maize germplasm.

13. Bolivia

Improvement of seed storage facilities at La Paz.

14. Paraguay

Collection of maize germplasm.

15. Chile

Collection of maize germplasm

16. Philippines

Collection of indigenous rice germplasm in South and Southeast Asian countries (IRRI). Ongoing since 1978. Maintenance of Southeast Asian banana germplasm - ongoing since 1978. Establishment of coconut genetic resources centre. Collection of fruit tree germplasm.

17. Malaysia

Collection and evaluation of banana germplasm by PCARR.

18. Indonesia

Exploration of banana germplasm in Sumatra and Eastern Indonesia. Collection of coconut germplasm.

19. Papua New Guinea

Collection of leafy vegetables and yams germplasm in Sepik and Madang provinces.

20. Thailand

Collection of Amaranth germplasm, Momordica sp. and rice germplasm. Seed storage facilities for conservation of germplasm.

21. East Africa (ICRISAT)

Collection of sorghum and millet germplasm.

22. Sudan

Collection of wheat germplasm in Jebel Marra.

23. Cyprus

Collection of Vicia faba germplasm.

24. Portugal and Spain

Collection of Secale and Lupinus germplasm.

25. Israel

Collection of lentils germplasm in South Europe.

26. Greece

Seed storage facilities for conservation of genetic resources.

27. Bangladesh

Collection of food legume germplasm.

28. Japan

Multiplication and distribution of genetic stocks of Triticum and Aegilops sp.

H Training and Follow-up

29. International post-graduate training on conservation and utilization of genetic resources at the University of Birmingham, UK, to enable additional students from developing countries to be trained.

30. Syria

Training Course on the collection, maintenance and utilization of wheat and barley germplasm for participants from the Mediterranean, South-west Asia and the South Asian countries.

31. Thailand

Training course on the collection and conservation of perennial crops - 30 June to 25 July 1980.

32. Argentina

Training course on collecting techniques - 14 April to 10 May 1980.

33. Nigeria (IITA)

Training course on Crop Genetic Resources Conservation - February/ March 1980.

Table 7 :

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Worldwide	Building up of national programmes	B, G				1974	
2. Thailand	Southeast Asia Regional Cooperative Programme	C, G, B	1 Germplasm Sc.	c	19,000 p.a.	1976	
3. Italy	Germplasm work in Mediterranean Region	C, G, B		c	190,000 p.a.	1976	
4. Syria (ICARDA)	Germplasm work in Southwest Asian Region	C, G, B	1 Germplasm Sc.	c	300,000 p.a.	1976	
5. U.K.; University Reading	Investigations on seed longevity	E2		c	50,000-75,000 p.a.	1978	
6. Australia; CSIRO	Long-term storage of grapes *in vitro*	E2		c	21,063	1980	
7. Netherlands; Royal Tropical Institute	Genetic resources of tropical and sub-tropical fruits and nuts	E2		c	74,460	1980	
8. Latin America; Brazil, Argentina, Peru, Bolivia	Collection of *Arachis* germplasm	G		c	106,000 for 4 yrs.	1976	

Table 7 :

IBPGR Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From	To
9.	Uruguay	Collection of forage germplasm	G		c	25,000	1978	
10.	Brazil; CENARGEN/ EMBRAPA	Collection of maize germplasm	G		c	25,000	1979	
	Brazil	Maintenance of Arachis living collection	G		c	25,000	1980	
11.	Colombia (CIAT)	Phaseolus collection in Latin America	G, C		c	61,000	1978	
12.	Peru	Collection of maize germplasm	G		c	23,000	1979	
	"	Collection of Lycopersicon germplasm	G		c	14,000	1980	
	"	Evaluation of maize germplasm	G		c	43,000 for 2 yrs.	1980	
13.	Bolivia; La Paz	Improvement of seed storage facilities	G		c	5,000	1979	
14.	Paraguay	Collection of maize germplasm	G		c	17,000	1979	
15.	Chile	Collection of maize germplasm	G		c	21,000	1980	

Table 7:

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From	To
16. Philippines	Collection of rice germplasm in South and Southeast Asia (IRRI)	G,C		c	40,000	1978	
"	Maintenance of banana collection in Southeast Asia	G,C		c	31,000	1978	
"	Establishment of coconut genetic resources centre	G					
"	Collection of fruit tree germplasm	G		c	10,000	1980	
17. Malaysia; PCARR	Collection of banana germplasm	G		c	10,000	1979	
18. Indonesia	Exploration of banana germplasm	G		c	10,000	1979	
"	Collection of coconut germplasm	G		c	13,500	1979	
19. Papua New Guinea	Collection of vegetables and yams germplasm	G		c	5,500	1980	
20. Thailand	Collection of Amaranth germplasm	G		c	10,000	1980	

Table 7 :

IBPGR Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From	To
	Thailand	Collection of Momordica sp. and upland rice germplasm	G		c	5,000	1980	
	"	Seed storage facilities	G		c	40,000	1980	
21.	East Africa (ICRISAT)	Collection of sorghum and millet germplasm	G		c	12,000	1979	
22.	Sudan; Jebel Marra	Collection of wheat germplasm	G		c	7,500	1980	
23.	Cyprus	Collection of Vicia faba germplasm	G		c	5,000	1980	
24.	Portugal & Spain	Collection of Secale and Lupinus germplasm	G		c	17,000	1980	
25.	Israel	Collection of lentils germplasm	G		c	3,000	1980	
26.	Greece	Seed storage facilities	G		c	40,000	1980	
27.	Bangladesh	Collection of food legumes germplasm	G		c	7,500	1979	
28.	Japan	Multiplication and distribution of genetic stocks of Triticum and Aegilops sp.	G		c	10,000	1979	

Table 7 :

IBPGR Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
30. U.K.; Univ. of Birmingham	Post-graduate training at the University of Birmingham	II		c	25,000-50,000 p.a.	1975		Partially UNEP
31. Syria (ICARDA)	Training on collection, maintenance & utilization of wheat and barley germplasm	II		c	35,000	1980		
32. Thailand	Training on collection and conservation of perennial crops	II		c	28,000	1980		
33. Argentina	Training on collection techniques	II		c	27,000	1980		
34. Nigeria (IITA)	Training on crop genetic resources conservation	II		c	25,000	1980		

Off-Campus Activities - IFPRI

E Collaborative Research Projects

E1 With Developing Countries

1. ASEAN Countries (Indonesia, Malaysia, the Philippines, Thailand) Rice Policy Research Project

The Rice Policy Research Project is a joint IFPRI, IFDC, IRRI effort to understand the various facets of government policies that impinge on rice, the most important commodity in the four Southeast Asian countries (Indonesia, Malaysia, the Philippines and Thailand), which form (with Singapore) the Association of Southeast Asian Nations (ASEAN).

IFPRI is allocating 2.75 senior staff person years of core budget support to this research effort in 1980 and 3.25 in 1981 in support of core research activities under the project and activities involved in project development. An IFPRI staff member is based at IRRI as field coordinator.

Collaborative linkages have been established with individuals and institutions in the four countries: Indonesia, Malaysia, the Philippines, and Thailand. Papers and studies have been and are being commissioned for work in connection with this project.

In addition the project provides for an annual workshop to be held in one of the project countries to discuss the progress of the research project.

IFPRI is seeking funding for the country level work under the project. The UNDP has provided support for the regional workshops.

2. Bangladesh Food for Work Project

The objective of this project is to do an in-depth evaluation of the Bangladesh Food-for-Work Programme. Plans are for the study to be undertaken jointly by IFPRI staff and the Bangladesh Institute of Development (BIDS) with funding from a consortium of organizations including: The World Food Program, CIDA, the Ford Foundation and the World Bank. IFPRI's contribution will be in the form of core staff input into the project. With the exception of the study activities carried out at IFPRI by IFPRI researchers, the project will be based in Bangladesh.

IFPRI will provide one core-budget person year of researcher time and related support services in 1980 and 1.75 person years in 1981 as follows:

- Project Coordinator and senior analyst on the budgetary value of an externally subsidized food-for-work programme;
- Senior Analyst on its short-term welfare benefits;
- Senior analyst on its development aspect. The work on this project also relates to the same researchers input to IFPRI's linkages project (see E3).

The donors will provide financing for the project, with a grant for start-up costs in the amount of $25,000 to be provided in dollars by the Ford Foundation directly to IFPRI. This grant will support IFPRI staff travel and other dollar costs at IFPRI relating to the development of the project. Other project related costs for both IFPRI and BIDS activities will be paid from a pooled fund to be created by the sponsoring organizations.

The project has been approved by the Government of Bangladesh, commitment of funds has been assured, and a formal agreement among donors, IFPRI and BIDS is scheduled for mid-October 1980.

In addition to the opportunity to participate in a joint activity with international and local organizations in the evaluation of a programme with important implications for food policy, IFPRI will expect to produce from this effort three reports reflecting the research interests of the three senior analysts assigned to the project.

3. India and Bangladesh

Linkages Project:

The focus of the linkages project is on the question: what do the indirect or the multiplier effects of agricultural growth mean for the poor in terms of the expansion of their income and employment opportunities. This research area is one of the core activities of IFPRI's production programme to which 2.3 person years of research time has been allocated in 1980 and 1981.

The Linkages project is being developed as a collaborative research effort between IFPRI core staff and institutions in developing countries. Through the Food for Work Project collaboration has been established with Bangladesh and the Bangladesh Institute of Development (BIDS). For India collaboration is being worked out with Tamil Nadu Agricultural University.

Research activities under the project will include:

- Econometric analysis of time series data to confront more directly the measurement of the dynamics of change induced by growth in food grains production, particularly its income and employment multiplier effects.

- Use of Social Accounting Matrices to trace the impact of change in various variables on the economy as a whole.
- Field research in India and Bangladesh.
- Analysis of the results of the data.

Support for the research based at IFPRI will be provided by IFPRI through its core budget. Support for the field research and for travel to bring developing country based researchers to IFPRI is being sought through special project funding.

It is anticipated that the collaborative research work will result in a research publication for each country area studied.

4. Bangladesh, the Philippines and Zambia

Food Subsidies and Nutrition Project:

The objective of this research project is to extend IFPRI's existing work on food subsidy/ration schemes in South Asia by reviewing what is known about such schemes in other areas of the world, including target oriented food distribution and benefits and costs involved in operating broad based and more narrowly targeted programmes in three countries: Bangladesh, the Philippines and Zambia. This research work is a major effort of IFPRI's distribution programme involving 1.25 senior research person years and related support services.

The research area is in two phases. The first, already under way and based largely at IFPRI, involves the review of the current state of knowledge in the field of food subsidy and nutrition policies and the etiology of malnutrition.

A main purpose of this first phase is to build linkages between IFPRI and local collaborating institutions as a prerequisite for the carrying out of Phase II of the research effort which involves country studies to be conducted by developing country researchers in conjunction with the IFPRI-based research staff.

To date collaborative linkages have been established:

- In Bangladesh through the Food for Work Program with the Bangladesh Institute of Development (BIDS).
- In Zambia with the Rural Development Studies Bureau of the University of Zambia and the National Food and Nutrition Commission.
- In the Philippines with Food and Nutrition Research Institute.

Special project funding is being sought for support of the country-based study activities.

Table 8 :

IFPRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff 1/	Funding			Donors
				Type	Amount $	Duration From To	
1. ASEAN countries Indonesia, Malaysia Philippines Thailand	Rice Policies Project (Joint project with IRRI, IFDC, and researchers and institutions in four rice producing countries of the ASEAN regional group, excluding Singapore)	E	1 Project Coord. 1 Field Coord. 3 Scientists 1 Scientist 2/ 1 Scientist 3/	sp, c	603,000	1.1.80 30. 9.83	UNDP. Others under negotiations
2. Bangladesh; BIDS	Food for Work Project	E	1 Project Coord. 2 Scientists	sp, c	450,000	1.7.80 31.12.84	WFP, CIDA, Ford Found., World Bank
3. India; Tamil Nadu Un. Bangladesh; BIDS	Linkages Project	E	1 Project Coord. 3 Scientists	sp	48,000	1.9.80 31.12.82	Ford. Found.
4. Bangladesh; BIDS Philippines; Food & Nutrition Research Institute	Food Subsidies & Nutrition Project	E	1 Scientist	sp	120,000	1.1.80 31.12.83	U.N. Univ.; Others under negotiations

1/The staff listed are not all working full-time on each project. See breakdown of man-years in the narrative

2/ IFDC Staff - 3/ IRRI Staff

Table 8 :

IFPRI Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
Zambia; Univ. of Zambia and Nat. Food & Nutrition Commission								

Off-Campus Activities - CIMMYT

A International Testing

1. The international testing networks coordinated by CIMMYT for maize, bread wheat, durum wheat, triticale and barley are a major form of linkage with national programme collaborators. In 1979, for example, CIMMYT sent out over 3000 sets of seeds, which included more than 50 different types of nurseries. This amounted to over 1 million individual seed packets sent to collaborators in 134 countries. These nursery sets included materials from national programmes as well as from CIMMYT. Nursery categories include nurseries for general screening and yield performance, resistance to specific diseases, adaptation to rainfed and irrigated conditions and adaptation to different altitudes and latitudes. Monitoring teams (regional and headquarters-based staff) periodically visit the nursery sites of collaborators. Nursery data processing and reporting are performed by CIMMYT.

B National Cooperative Projects

Some national programmes within the worldwide network of maize and wheat growing countries have asked for direct staff assistance and exhibited a strong commitment to develop effective national crop improvement and production research programmes. CIMMYT receives special funding to provide this collaboration.

CIMMYT staff assigned to national programmes work on a daily basis as full-time associate staff to help organize maize and wheat improvement and production programmes, develop research facilities and train national staff. Once a national programme is reasonably developed and operating, the CIMMYT staff is withdrawn although continuing contact is maintained.

2. Pakistan

Both the maize and wheat programmes have staff seconded to Pakistan. A Ford Foundation Grant of $ 2,527,350 covering a 15 year period (1965-80) and a USAID grant of approximately $ 1,134,000 covering a five year period (1976-80) have enabled CIMMYT to maintain its staff in Pakistan. During this period CIMMYT has had various teams of breeders and agronomists assigned to the country. At present one maize breeder and one wheat agronomist are assigned to Pakistan. On-farm research receives considerable emphasis in both programmes.

3. Zaire

A Zairian grant of $ 2,548,750 covering the period 1971-81, and USAID grants (for training) of $ 391,000 covering the periods 1977-79 and 1980-81, support this cooperative effort. The CIMMYT team has varied in size and has included breeders, agronomists, pathologists and a training officer. In 1980, only one breeder/agronomist is assigned to this programme. Major activities include varietal development, plant protection research, training for national staff and on-farm research.

4. Tanzania

Grants from USAID (subcontracted through IITA) of $ 1,136,942 covering 1973-76 and $ 241,000 covering 1976-80 have supported this programme. A two-man team (breeder and agronomist) is assigned to the Tanzanian maize programme. Special breeding attention has been given to developing greater resistance to streak virus in adapted maize materials. The development of national programme staff, experiment station facilities and on-farm research programmes are major components of CIMMYT-Tanzanian cooperation.

5. Ghana

A grant from CIDA (Canada) of $ 588,150 covering the years 1979-83 supports this programme. One agronomist is assigned to the national maize research programme. On-farm research and national staff development are major priorities.

6. Algeria

Ford Foundation grant totalling $ 470,350 covering the period 1979 to 1982 is funding a special project in Algeria. The purpose of the grant is to undertake an economic study of the country's cereal sector and to provide advanced training for the staff of the Algerian Institute for the Development of Field Crops. At present, one resident staff member, an agricultural economist is assigned to the Algerian National Programme.

C, D Regional Programmes including Core Research outside the Host Country

CIMMYT has assigned staff to regional programmes based in Africa, Asia and Latin America. These regional staff are integral members of the maize, wheat and economics programmes.

Typically, regionally assigned staff provide leadership in the following CIMMYT programme activities:

(1) Special breeding problems in which the region provides the most suitable research base;

(2) Crop production research, particularly agronomy;

(3) Monitoring of international and regional testing trials and nurseries;

(4) Coordination and improvement of training opportunities for national staff, within and outside of region; and

(5) Feedback to Mexico-based research and training programmes on production problems affecting agriculture within the region.

Each region includes a number of countries (which may differ for each CIMMYT programme), usually geographically contiguous, which possess similar production environments and problems. Such countries agree to strengthen through regional cooperation the exchange of germplasm and scientific information. Regional programmes for maize, wheat and economics are described below.

7-11. Maize Regional Programmes

By mid 1980, CIMMYT had maize staff assigned to five regional programmes, as described below:

Area	Started	1980 CIMMYT staff	Current donor
7. Central American and Caribbean	1974	1 breeder 1 agronomist	Switzerland
8. Asia	1976	1 breeder/agronomist	UNDP
9. Andean	1976	1 breeder/agronomist 1 breeder, 1 entomologist	Canada
10. Mideast	1979	1 breeder/agronomist	Core Unrestricted
11. West Africa	1980	1 breeder	Core Unrestricted

In addition to the regular regional activities, each maize regional programme is responsible for specific breeding activities within the total

maize improvement programme. These include downy mildew resistance (Asia), streak virus (West Africa), floury maize improvement (Andean), temperate-tropical maize improvement (Mideast) and corn stunt (Central America).

12-16. Regional Wheat Programmes

By mid 1980, the following regional wheat programmes were in operation:

Area	Started	1980 CIMMYT staff	Current donor
12. Disease Surveillance	1973	2 pathologists [1/]	The Netherlands
13. East Africa	1975	1 breeder [1/]	UNDP
14. Andean	1976	1 breeder/pathologist	Canada
15. Southern Cone	1978	1 agronomist	Japan
		1 breeder	
16. North-West Africa	1980	1 breeder	Core Unrestricted

Again, as in the maize regional programmes, regional wheat scientists play special roles in the total CIMMYT germplasm improvement scheme. Screening of materials in disease hot spot areas is as follows: stripe rust (East Africa and Andean), stem rust (East Africa), Septoria (North- West Africa), rynchosporium (Andean), barley yellow dwarf (Andean and Southern Cone) and Helminthosporium (Asia and East Africa). In addition, the disease surveillance programme monitors disease situations in the wheat-growing area stretching from Asia to North and East Africa. The wheat programme also operates regional disease screening and yield nurseries.

17-20. Economics Regional Programme

In 1980, the Economics Programme had staff assigned to four regional programmes, as follows:

1/ In addition to regularly assigned CIMMYT staff, the Dutch Government has assigned two pathologists as associate staff in East Africa, and in the Mediterranean and Middle East.

Area	Started	1980 CIMMYT staff	Current donor
17. East Africa	1975	1 agric. economist 1/	UNDP
18. Andean	1977	1 agric. economist 1/	Core Unrestricted
19. Central America and Caribbean	1978	1 agric. economist	Switzerland
20. Asia	1976	1 agric. economist	UNDP

The emphasis in all regional economics programmes is on the development and introduction of interdisciplinary research procedures aimed at improving production-oriented research activities which lead to farmer recommendations. The on-farm research strategies advocated by CIMMYT feature strong links between biological and social scientists.

E Collaborative Research Projects

E1 With Developing Countries

In a general sense, almost all of CIMMYT's crop improvement and production research is in collaboration with scientists in developing countries. The international germplasm improvement and testing networks include materials submitted by national programmes as well as those emanating from the CIMMYT breeding programme in Mexico.

There also are special breeding efforts with particular countries which are referred to by CIMMYT as "collaborative research projects". In these cases, CIMMYT engages in a "shuttle breeding" effort with selected countries to accelerate research progress on a particular problem (e.g. downy mildew or aluminum toxicity tolerance). Through shuttle breeding, two alternate breeding cycles are carried out each year, one in the collaborating country (e.g. screening for disease resistant or soil toxicity tolerant materials) followed by a breeding cycle in Mexico for general agronomic improvement of the superior materials. In most of these cases CIMMYT and its collaborators jointly underwrite the costs associated with the project. In some cases, CIMMYT provides modest financial support to provide simple equipment needed by project collaborators or to facilitate travel of collaborating scientists to observe the performance of their selected materials in the CIMMYT-Mexico nursery (or trial cycle).

1/ In addition to the regular CIMMYT staff, one post doctoral fellow is assigned to the Andean region and one predoctoral fellow is assigned to East Africa.

E2 With Developed Countries

21-23. CIMMYT's involvement with scientific institutions in the developed world tends to emphasize basic scientific research such as the spring x winter wheat crossing programme with Oregon State University,USA, the wide crosses research with Kansas State University (both now completed) and the maize temperate x tropical crossing programme with Hohenheim University, Federal Republic of Germany. Many collaborative basic studies in genetics, pathology, cytology are also under way with more than 30 institutes in 12 developed countries. Most of these arrangements are financed through special grants to the collaborating institutions with CIMMYT cooperating in the supply of germplasm and monitoring research results.

G Germplasm Collection, Preservation and Utilization

24. CIMMYT operates germplasm bank units for maize, wheat, barley and triticale. These units maintain, catalogue and regenerate seed; and handle special seed requests and shipments to cooperators.

CIMMYT has the world's largest collection of maize germplasm (and related species), numbering approximately 13,000 accessions in cold storage. The wheat programme, up to 1980, only has operated a minimal short-term cold storage seed maintenance unit for its four crops. CIMMYT is now building a new wheat germplasm facility which is slated for completion in 1981. In addition to germplasm maintenance, per se, the wheat bank also will have sufficient space for actual working collections and for small-scale seed supply increases for other collaborating countries. This programme is supported largely from core budget funds.

H Training and Follow-up

25. In-service trainees, visiting and associate scientists and fellows at CIMMYT number around 300 per year. Approximately 140 of these are in-service trainees in wheat, maize and economics. Most of these trainees spend one crop season in Mexico (5-7 months) in one of the 13 in-service training courses offered each year in breeding, production agronomy, economics, experiment station management and laboratory sciences.

Visiting and associate scientists spend from several weeks to one year working within CIMMYT's research programmes. Graduate students and postdoctoral fellows spend from one to two years as associate staff within the programmes. Graduate student fellows conduct thesis research under the guidance of CIMMYT staff. Regionally and nationally assigned staff, along with programme staff and training officers in Mexico, frequently participate

in in-country training programmes, field days and workshops.

CIMMYT staff, assigned to headquarters and outposted to regionaland national programmes, make considerable efforts to keep in touch with many of the several thousand scientists who have participated in CIMMYT training programmes. Many of these alumni are international testing collaborators who maintain ongoing and close contact with the CIMMYT staff.

I Consultation to National Programmes

26. CIMMYT's years of research and production experience under varying conditions prompt many national programme calls for counsel on the organization of research on maize and wheat and on ways to reduce constraints limiting production. While CIMMYT has no formal, scheduled programme of consultation to national programmes, CIMMYT staff travel extensively, reaching more than 70 countries in the collaborator network each year.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To 1/	
1. Worldwide	Maize, Wheat, Triticale, Barley Nurseries	A		c	-	1965	Indefinite	-
2. Pakistan	Strengthening national Programmes	B	1 Maize Breeder 1 Wheat Agronomist	sp	3,661,350	1965	1980	Ford Found. USAID
3. Zaire	Strengthening national Programmes	B,H	1 Breeder/Agronomist	sp	2,548,750	1971	1981	Government of Zaire
4.Tanzania	Strengthening national Programmes	B,H	1 Breeder 1 Agronomist	sp	1,377,942	1973	1980	USAID
5. Ghana	Strengthening national Programmes	B,H	1 Breeder/Agronomist	sp	588,150	1979	1983	CIDA
6.Algeria	Strengthening national Programmes	B,H	1 Agric. Economist	sp	470,350	1979	1982	Ford Foundation
7. Central Americ./ Caribbean(Maize)	Regional Coordination & Corn Stunt Research	C,D	1 Breeder 1 Agronomist	rc	1,700,000	1976	1982	Switzer-land
8. Asia (Maize)	Regional Coordination & Downy Mildew-Research	C,D	1 Breeder/Agronomist	rc	2,808,290 2/	1976	1984	UNDP

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
9. Andean (Maize)	Regional Coordination & Floury Maize Improvem.	C,D	1 Breeder/Agronomist 1 Breeder 1 Entomologist	rc	1,145,000	1976	1980	CIDA
10. Mideast(Maize)	Regional Coord. & Temperate-Tropical Maize Improvement	C,D	1 Breeder/Agronomist	c	-	1979	Indefinite	-
11. West Africa (Maize)	Regional Coord. & Streak Virus Research	C,D	1 Breeder	c	-	1980	Indefinite	-
12. Disease Surveillance (Wheat)	Early Warning Disease Surveillance	C	2 Pathologists	rc	2,761,440 2/	1974	1982	Netherlands
13. East Africa (Wheat)	Regional Coord. & Stripe Rust & Helminthosporium Res.	C,D	1 Breeder	rc,c	1,824,870 3/	1975	Indefinite	UNDP
14. Andean (Wheat)	Regional Coord. & Stripe Rust, Stem Rust Rynchosporium, Barley Yellow Dwarf Research	C,D	1 Breeder/Pathologist	rc	641,215	1976	1980	CIDA
15. Southern Cone (Wheat)	Regional Coord. & Barley Yellow Dwarf Research	C,D	1 Agronomist 1 Breeder	c,rc	1,700,000 3/	1978	Renewed annually	Japan

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
16. North and West Africa (Wheat)	Regional Coord. & Septoria Research	C,D	1 Breeder	c	-	1980	Indefinite	-
17. East Africa (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	1,000,000 2/	1975	1984	UNDP
18. Andean (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	c	-	1977	1981	-
19. Central America/Caribbean (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	109,200	1977	1982	Switzerland
20. Asia (Economics)	Regional Coord. & Development of On-farm Research Procedures	C	1 Agric. Economist	rc	700,000 2/	1979	1984	UNDP
21. Yugoslavia	Rust Identification	E2		c		1975	Indefinite	
22. Israel	Rust Identification	E2		c		1975	Indefinite	

Note: Explanation of footnotes see page 84.

Table 9 :

CIMMYT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
23. Germany	Temperate x Tropical Maize Crossing	E2		c		1978	Indefinite	
24. Worldwide	Germplasm Collection, Preserv. & Utilization of Maize, Wheat, Barley, Triticale	G		c		1965	Indefinite	
25. Worldwide	Training & Follow-up (see text)	H		c 4/		1965	Indefinite	
26. Worldwide	Consultation to national Programmes (see text)	I		c		1965	Indefinite	

Explanation of footnotes:

1/ Some grants may be extended
2/ Approximate
3/ Restricted core only
4/ Many restricted core and special project grants also contain a training component

Off-Campus Activities - CIAT

Off-campus activities of CIAT are organized around the four commodities within the Centre's mandate (i.e. beans, rice, cassava, tropical pastures) and are presented accordingly.

Beans

A International Testing

1. International Bean Yield and Adaptation Nursery (IBYAN)

The CIAT Bean Programme utilizes a stepwise scheme to produce and test its improved germplasm. Materials are selected in two successive preliminary nurseries before being entered into the IBYAN, which is a replicated nursery that is shipped worldwide. In 1979, a total of 142 trials were shipped to 30 collaborating countries. Fifty-two of these trials (21 entries each) were for bush-type black materials; 70 trials (32 entries each) were for bush-type non-black materials; and 20 trials were for climbing beans. The evaluation parameters are primarily focused on yield and disease resistance.

2. Factor-specific Nurseries

The Bean Programme conducts a series of factor-specific nurseries with cooperating countries which include nurseries for: resistance to Apion godmani; resistance to Empoasca; high temperature tolerance; N-fixation capacity; resistance to rust; anthracnose; Golden Mosaic virus; web blight. The number of sites for these nurseries ranges from 3 to 17.

B National Cooperative Projects

3. Bean Research and Development in Guatemala

A major grant of USAID plus additional resources from the Rockefeller Foundation have made it possible for CIAT to station two bean researchers with ICTA in Guatemala for the purpose of adapting promising CIAT-generated materials to local conditions and to develop BGMV tolerant varieties.

4. National Bean Programme Development in Peru

A grant from the Swiss Government has enabled CIAT to place a bilateral bean researcher in Peru for a four-year period. This researcher acts as a liaison between the CIAT Bean Programme and Peruvian efforts in bean research/production.

C Regional Programmes

5. Regional Services: Central America/Caribbean

A major portion of a UNDP project for international cooperation activities that was funded from late 1977 through June 1980 was devoted to the placing of a regional services scientist in the Central America/Caribbean area. Currently, this effort is financed out of core. Responsibilities of this scientist include to assure free flow of materials and information between the region and CIAT, the selection of training participants and training follow-up, consultancy services to national programmes, and arrangements to assure free flow of information and materials between the countries of the region.

6. Improvement of Bean Production in Central America and the Caribbean

This regional bean project is to start in September 1980 and will include the regional services staff described in 5. above, plus two additional bean researchers. The project is intended to work in collaboration with national programmes in the regional adaptation of promising CIAT and other materials, and to work on region-specific production constraints. This three-year project is Swiss funded.

E Collaborative Research

E1 With developing Countries
(3. and 4. above)

E2 With developed Countries

7. Gembloux University (Belgium)/CIAT

This collaborative research project is on germplasm evaluation (Phaseolus spp.), flowering physiology, and interspecific crosses. The Belgian Government grant finances complementary work carried out both at Gembloux University and CIAT. In this project are involved the direct services of four associate scientists: two working at CIAT as FAO associate experts, and two Belgian scientists working at Gembloux.

G Germplasm Collection

8. A three-year grant of IBPGR makes it possible for CIAT to collect - mostly through the services of national institutions - additional Phaseolus spp. germplasm material.

H In-Country Training Assistance

9. The Bean Programme, in collaboration with the Training Programme, assists various in-country training efforts which normally are organized, financed and conducted by collaborating national programmes. The CIAT-involvement is of a catalytic and advisory nature. The CIAT participation is financed out of a combination of various special projects and core resources. On a yearly basis, an average of one to two in-country efforts in bean research/production are supported by CIAT.

I Consultancy Services

10. An integral part of the work responsibilities of all senior staff members of the CIAT Bean Programme is to extensively consult with and advise national counterpart scientists.

Cassava

A International Testing

11. International Trials

The international trials as coordinated by the Cassava Programme currently are distributed over 12 countries in Latin America. These yield trials had been initiated four years ago and had reached a total of 21 cycles harvested by the end of 1979.

B National Cooperative Projects

12. National Regional Trial Networks 1/

The CIAT Cassava Programme assists collaborating national programmes in the organization, conduct and evaluation of national regional trial networks which contain promising CIAT lines, CIAT selections and national

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1/ "Regional" in the sense that these trials are conducted in different regions within a given country.

entries. In 1979, there were a total of 120 trial sites in 10 different Latin American countries and three Asian countries.

C Regional Programmes

13. Outreach Programme for Latin America

A five-year project funded by IDRC has enabled the Cassava Programme to employ one outreach scientist to provide outreach services to Latin American countries. This scientist is involved in the coordination of international trials, the assistance to national programmes in the organization of national regional trials, the identification of training participants (including training follow-up), the facilitation of the flow of information and germplasm to and from collaborating programmes in Latin America and in providing consultancy services to national programmes. The IDRC grant for this project includes monies for training scholarships. This special project will come to its conclusion by the end of 1980.

14. Outreach Programme for Asia

A second IDRC-financed special project has contained funds for training scholarships of Asian cassava workers and for a regional services staff posted in the Philippines. The responsibilities for this cassava scientist were similar to the ones described for the outreach scientist in 13. above, but for the Asian region. This project terminated on 30 June 1980.

E Collaborative Research

E2 With developed Countries

15. Mycorrhiza Research

CIAT, in collaboration with the University of Goettingen, is now initiating research on the potential of mycorrhiza to increase crop production on infertile soils with low P availability. The project will focus on cassava, but will also investigate grain legumes and tropical pastures in an attempt to develop a utilization methodology for this natural resource. At the University of Goettingen (West Germany) long-term experience with mycorrhiza exists combined with interest to work in the tropics. The German Development Agency (GTZ) is financing the two-year research project which will include the stationing of one German scientist at CIAT.

H In-Country Training Assistance

16. In collaboration with the Training Programme, the Cassava Programme offers assistance to in-country cassava training courses. While the in-country training efforts are financed and organized with non-CIAT resources, the direct CIAT assistance to these courses is financed out of core funds or from funds from third parties. On a yearly basis, an average of one to two in-country cassava courses are provided direct CIAT assistance.

I Consultancy Services

17. Consultative services to national programmes are provided by the members of the Cassava Team on a continuing and extensive basis.

Tropical Pastures

A International Testing

18. Adaptation Trials

The primary attention of the Tropical Pastures Programme is given to the well-drained, tropical savanna of tropical America. Throughout this area, the Programme is conducting a network of regional trials in an effort to enhance and reinforce the evaluation work on tropical grasses and legumes as it is being conducted at two research sites within the well-drained savannas. At the same time, in order to evaluate forage germplasm on a preliminary basis for adaptation to areas within the Programme's mandate which do not fit the above description, another series of adaptation trials are being conducted in which more than 100 accessions of a series of species are being evaluated for adaptation to edaphic and climatic conditions. Sites of this latter type of trials are in Colombia, Venezuela, Peru and Brazil. All adaptation trials are conducted in collaboration with national programmes.

D Core Research Outside Host Country

19. Pasture Technology Development for the Cerrado Region

The well-drained, tropical savanna as referred to above consists of two distinct ecosystems: the so-called "hyperthermic" ecosystem (as represented for example, by the Eastern Plains of Colombia); and the so-called "thermic" ecosystem (as represented, for example, by the Cerrados of Brazil). While the former ecosystem receives full attention from CIAT within the Centre's host country, the latter ecosystem is being served by three core-funded out-posted research scientists located at a collaborating Brazilian research

institution (i.e. the CPAC station of EMBRAPA) in Brasilia. The scientists involved are a forage agronomist, a pasture development specialist and a cattle production specialist.

E Collaborative Research

E2 With developed Countries

20. IFDC/CIAT Phosphorus Project

This five-year special project which is financially supported by IDRC and UNDP channeled through IFDC involves the stationing at CIAT of two senior scientists. The project integrates the fertilizer research activities at IFDC on resource characterization, chemical engineering, pilot plant production of experimental fertilizers and initial effectiveness screening with the agronomic research activities at greenhouse and field levels at CIAT and with related activities in cooperating institutions in Colombia, Peru and Ecuador. The agronomic portion conducted on the acid, infertile soils of Latin America focuses on the measurement of (a) initial and residual P availability from local phosphate resources (i.e. indigenous rock phosphate deposits) and modified products produced from these by IFDC and (b) identification of the most effective P management strategies as affected by the inter-relationship between P source, soils properties, crop type and methods of application.

F Collection of Information and Data

21. Evaluation of Beef Production Systems

The Beef Production Systems Evaluation Project (ETES) is directed to analyzing beef farming operations in the two well-drained savanna ecosystems in Colombia and Venezuela and in Brazil. The project's first pahse involves analyzing selected farms in each region to define the prevailing technology and factors limiting beef production. The second phase is to involve the analysis of the effects of introducing new production technologies. This four-year project supported by the German Development Agency (GTZ) includes the stationing at CIAT of selected German associate scientists who closely collaborate with the CIAT and national programme counterparts involved in the Project.

I Consultancy Services

22. Consultancy services to national programmes are provided by the staff

of the Tropical Pastures Programme on a continuing basis and form an integral part of the staff's responsibilities.

Rice

A International Testing

23. Rice Testing Programme for Latin America

IRRI has placed at CIAT a liaison scientist for Latin America who is coordinating the International Rice Testing Programme for Latin America (see description in the IRRI section). All promising CIAT-developed breeding lines are also entered in this testing programme. In 1980, a total of 287 sets of the 14 nurseries in the Rice Testing Programme for Latin America have been sent to collaborators in the region.

C Regional Programmes

24. Regional Services for Central America

Some US$ 228,000 of a UNDP project in the area of CIAT international cooperation activities (total grant: US$ 1.6 million) was for providing regional services in rice to the Central American region. Accordingly, from late 1977 through May 1980 CIAT had stationed a regional services staff to the region (with headquarters in Costa Rica). His responsibilities included: to liaise between the CIAT Rice Programme and cooperating national programmes in the region; to engage in selected research activities on rice production constraints in the area; to select training participants (including follow-up); and to be instrumental in assuring the free flow of information and materials between the national programmes in the region.

E Collaborative Research Project

E1 With developing Countries

25. CIAT/ICA Collaboration

From the beginnings of CIAT's rice activities, a very close and special relationship with the Instituto Colombiano Agropecuario (ICA) has characterized the rice technology development work. Much of the hybridization and evaluation work of CIAT is done in direct collaboration with ICA, both at installations and research sites of either CIAT or ICA. While there is no combined budget for the rice development work, each party contributes its resources to the overall effort. It should be pointed out, however, that

while there is much collaboration between CIAT and ICA in this area, the rice programmes of the two respective institutions nevertheless maintain a separate identity; there are many aspects of rice research and development that more befit an international centre and which are pursued by CIAT alone.

H In-Country Training Assistance

26. In collaboration with the Training Programme, the Rice Programme directly assist one to two in-country training courses through the assigning to such courses a CIAT rice training specialist, relevant training materials and selected course inputs by CIAT rice researchers. Whenever possible, the CIAT contribution is financed through special project contributions; if such are not available, limited core funds are utilized.

I Consultation to National Programmes

27. As is the case with the other CIAT programmes, the Rice Programme carries on consultation activities to national programmes on an extensive basis. Whereas there is no formal programme of consultation, the Programme's scientists travel extensively throughout the Latin American region as part of their research endeavours and use these opportunities to consult with national counterparts and to provide assistance to the extent possible.

Training

28. On a yearly basis, more than 300 training participants work and study at CIAT. In recent years, some 50 % of these were participants of CIAT courses organized around the respective commodity programmes; these courses have a duration of 4 to 8 weeks. Some 50 additional training participants engage in a thesis project at CIAT, be it at the MS or the PhD level (CIAT collaborates with various universities with respect to formal degree programmes while the academic portion of the study programme is completed at the respective university, the thesis portion takes place at CIAT. As CIAT is not a degree-granting institution, the degrees are awarded by the university involved). An additional group of trainees (which numbers close to 100 on a yearly basis) are postgraduate research interns who normally are research personnel at collaborating national institutions and are invited to work and study at CIAT under the personal supervision of a given senior scientist of the Centre for periods ranging from three to twelve months.

As most of the CIAT training participants continue their careers in the employ of collaborating national institutions, training follow-up is being provided by continuing contacts between the trainees and their counterparts at CIAT. At the same time, these former training participants become to form integral parts of the commodity research networks as organized by CIAT and thereby have a chance to interact not only with CIAT scientific staff, but also with colleagues in other countries.

In the recent past, some two-thirds of CIAT's headquarters based training activities have been financed out of core funds,while the remaining one-third was contributed through special projects.

Seed Project

29. Through a three-year grant from the Swiss Government in the amount of US$ 1,980,300 CIAT has established a Seed Unit that cooperates with the CIAT commodity programmes in multiplying, processing, storing and distributing advanced experimental breeder material and Breeder and Basic Seed to collaborating countries for farmer trials and/or further multiplication. The Seed Unit also extends technical collaboration to Latin American countries to meet a wide range of seed-related needs. The Seed Unit also engages in the training of governmental and private institutional personnel in various aspects and at different levels of seed industry and programme development and seed technology. Two senior scientists form part of the Seed Unit.

Note:

CIAT is host to two CIMMYT scientists who are part of the CIMMYT/CIAT Andean Regional Maize Unit. Detailed information on this endeavour can be found in the report on CIMMYT.

Table 10 :

CIAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
BEANS								
1.	International Bean Yield & Adaptation Nursery	A		c				
2.	Factor-specific Bean Nurseries	A		c				
3. Guatemala; ICTA	Bean Research & Development in Guatemala	B,El,I	(1 Bean Pathologist) 1 Bean Breeder	sp	375,800	20.2.77	31.12.80	USAID,Rockefeller Found.
4. Peru	National Bean Programme Development	B,El,I	1 Bean Agronomist	sp	392,400	1.4.79	31.3.83	Switzerland
5. Costa Rica	Regional Services: C.America/Caribbean	A,C,H,I	1 Bean Pathologist	sp,c	196,000	1.1.78	30.6.80	UNDP(1.10.77-31.12.79) Core(1.1.80-30.9.80)
6. Central America	Improvement Bean Production: C.America/Caribbean	C,El	0 + (1 Bean Breeder, 1 Bean Pathologist, 1 Cropping Systems Agronomist)	sp	1,145,500	1.9.80	31.12.83	Switzerland

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
7.	Belgium; Gembloux Univ.	Germplasm Evaluation, Flowering Physiology, Interspecific Crosses	E2	2 Assoc.Scientists 1/	sp	400,200 2/	23.5.77	31.12.80	Belgium
8.		Germplasm Collection	G		sp	61.000	1.1.78	31.12.81	IBPGR
9.		Assistance to In-country Training Courses	H		sp,c				Collab. national proprammes
10.		Consultancy Services to national Programmes	I		c				
	CASSAVA								
11		International Trials	A		c				
12.		National Regional Trials	B						
13.		Outreach Programme for Latin America	A,B,C,G H, I	1 Cassava Agronomist	sp	340,000	6.2.76	31.12.80	IDRC
14.	Philippines	Outreach Programme for Asia	A,B,C,F H, I	(1 Cassava Agronomist)	sp	398,000	3.3.76	30.6.80	IDRC

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
15.	Germany; Goettingen Univ.	Mycorrhiza Research 3/	E2	1 Soil Microbiologist	sp,c	48,100 4/	15.8.80 14.8.82	W.Germany
16.		Assistance to In-Country Training Courses	II		sp,c			
17.		Consultancy Service to national Programmes	I		c			
	TROPICAL PASTURES							
18.		Adaptation Trials	A		c			
19.	Brazil	Pasture Technology Development for the Cerrado Region	D,E1	1 Forage Agronomist 5/ 1 Pasture Dev.Specialist 5/ 1 Cattle Prod.Specialist 5/	c			
20.	USA; IFDC	Evaluation of Indigenous Phosphate Resources as Fertilizer	E2	2 Soil Scientists	sp	897,500	12.7.77 30.6.82	IDRC, UNDP
21.	Brazil, Venezuela, Colombia	Evaluation of Beed Prod. Systems	F,E1	3 Assoc.Scientists	sp	388,000	19.1.78 18.1.81	W.Germany

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
					Type	Amount $	Duration From	To	
22.		Consultancy Service to National Programmes	I		c				
	RICE								
23.		Regional Rice Testing Progr.	A,C		sp 6/				
24.	Costa Rica	Regional Services:Central America	C,II,I	1 Rice Breeder	sp	228,000	1.10.77	31.5.80	UNDP
25.	Colombia; ICA	Breeding plus Evaluation of Segregating Materials	E1		c 7/				
26.		Assistance to In-country Training Courses	II		sp(c)				
27.		Consultancy Services to national Programmes	I		c				
	TRAINING								
28.		Headquarter-based Training Activities	II		c,sp				Various

Note: Explanation of Footnotes see page 98.

Table 10 :

CIAT Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding				Donors
				Type	Amount $	Duration From	To	
	SEED PROJECT							
29.	Seed Unit	I,II	2 Seed Specialists 8/	sp	1,980,300	7.11.78	6.11.81 9/	Switzerland

Footnotes:

1/ Two FAO associate experts are stationed at CIAT; two additional associate scientists are working on the project in Belgium.

2/ Two FAO associate experts not included.

3/ In collaboration with University of Goettingen.

4/ Special project contribution by GTZ; does not include scientist.

5/ One of these positions was special project funded under an international cooperation grant from UNDP for the period 4.2.78 - 30.6.80.

6/ IRRI has stationed at CIAT an IRRI liaison scientist who coordinates the International Rice Testing Programme for Latin America.

7/ Core funds are used for CIAT contribution only; the counterpart (Instituto Colombiano Agropecuario) finances its own contribution.

8/ Posted at CIAT.

9/ The financing of a second phase (i.e. an additional two years) has been earmarked by the Swiss Government.

Off-Campus Activities - CIP

B National Cooperative Projects

1. Rwanda

The Belgium AGCD is financing two CIP scientists in Rwanda at $ 120,000 for a five-year period. The principal financial support for the Rwandese research programme comes from the same donor through bilateral aid. The responsibilities of the team include introduction of improved germplasm, a multiplication scheme for seed potatoes, on-farm trials of improved technological packages and overall development by in-service training of research personnel. The team members are an agronomist and virologist. This project is expected to link in with bilateral support for Burundi and other neighbouring states and to become a focal point for improved technology.

2. Tunisia

CIP receives approximately $ 60,000/annum from CIDA, Canada, to station one scientist in the country whose principal task has been to establish a seed production scheme to reduce dependance on imported seed. The project is in its final year. At present it is not intended to renew the project in 1981, but plans are being made to capitalize on the success of the programme and develop a regional programme for francophone Africa by 1982 with Tunisia as the headquarters.

An annual one-month seed production course in French has been conducted in Tunisia for the past three years. Funds up to $ 30,000 are provided by AGCD Belgium and participants come from as far away as Madagascar. This is the only French course of its type anywhere in the world.

3. Nepal

Funds are provided by the Swiss Technical Assistance Agency, approximately $ 250,000 during the second phase of three years for one scientist to work with the Nepalese programme. The project is now in its fifth and final year and it is not proposed to extend in 1981 now that a large Swiss Technical Assistance team has taken over the principal responsibilities of the CIP expert. The project aimed at developing technical capability within the programme and identifying and multiplying varieties

with resistance to the main diseases and pests found in Nepal. A number of clones have advanced to varietal status. Identifying candidates for advanced training has been especially important as the Nepalese programme had to be established without reservoir of trained personnel. Part of the project funds are being used to finance advanced degree training.

4. Bangladesh

The funds for this project are administered by LADS and will probably continue for three years. One ex-CIP potato expert is now on the staff of LADS and working with the national programme. Technical support for the project is provided through our regional programme in India.

5. Central America

The role of CIP is different in this project to any other. The principal task is to coordinate research activities within six countries, Mexico, Guatemala, Honduras, Costa Rica, Panama and Dominican Republic to provide the basis for a complete regional potato research programme. Funds for the project, approximately $ 1,900,000 over five years are provided by the Swiss Technical Assistance Agency. More than 95 % of the funds are channeled to national potato research programmes to be administered by their own organizations. CIP financed the Coordinator post during the start up phase until June 1980, and continues to support on technical problems and in technical evaluations through short-term consultancy visits.

C Regional Research Programme

6-13. This is the core funded network through which CIP evaluates and transfers its germplasm and other technology to national programmes. In Kenya, Turkey and Philippines, regional evalutation, multiplication and distribution centres have been or are being established to receive improved germplasm from CIP. These are locally evaluated and best clones redistributed to other countries of the region. Other technology such as low-cost storage, production of potato from botandral seed and seed potato multiplication techniques are tested and developed by the regional scientists.

D Off-Campus Core Research Activities

A list is given of major research activities financed by core funds both in developed and developing countries. This has been a feature of CIP

core research from the beginning and has been a very effective way of utilizing expertise and facilities in those institutions with on-going related research programmes.

14-16. Recently CIP has utilized two post-doctoral positions to expand off-campus research in Turkey and the Middle East in tuber-moth epidemiology and control; and in the Philippines, to evaluate the Optimizing Productivity strategy. More use will be made of this type of investigation, both full and on part-time basis. At present a nutritionist post-doctoral is in Rwanda for five months on a case study of the role which potatoes can play in an African diet.

E Collaborative Research Projects

E1 With Developing Countries

1-4.; 6-13.; 15.

Major core projects are covered under Section D. No major non-core research projects are contemplated at this time. Minor collaborative projects are taking place in several countries, which may involve small amounts of core funds up to approximately $ 5,000 to assist in the purchase of materials, labour, etc. to advance the project. These types of investigations cover late blight resistance (Colombia); evaluation of germplasm and botanical seed technique (Ethiopia); evaluation of tropically adapted germplasm (Sri Lanka); and testing of low cost storage technology (Peru, Colombia, Philippines).

E2 With Developed Countries

17-28. See Table 1L.

H Training and Follow-Up

1-4.; 6-13.

Most in-service or short-term group training is conducted at regional headquarters. CIP, Lima offers training on an individual or small group basis in such subjects as virology, pathology, meristem propagation and other specialist subjects. A number of Spanish speaking students on CIP scholarships are always conducting research for M.S. using the Lima facilities with course work at the nearby Agricultural University of La Molina. A few selected scientists receive scholarships for higher degree training at universities in developed countries. Recently a research

programme for mid-career scientists has been started to enable key persons to work at CIP using our facilities and genetic materials.

I Consultation to National Programmes

3-4.; 6-8.; 10-11.; 13.

The Regional Programmes are the principal contact with national programmes and arrange consultancies as indicated. In the event that a specialist consultation is requested and cannot be accommodated locally, opportunity is taken to use visits by CIP scientists coming to the region to evaluate collaborative research projects. Funds have been made available by The Netherlands and German Governments which permit CIP to request their national scientists for special consultancies.

All consultancies are primarily of a technical nature, however, assistance is given by the regional scientists when asked to revise proposals for bilateral assistance to potato research in order to see that all the main components are adequately catered for.

Table 11 :

CIP Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
1. Rwanda	Strengthening national Research Capability	B,E1,H	1 Virologist 1 Agronomist	rc	120,000 p.a.	1978 1983	Belgium(AGCD)
2. Tunisia	Strengthening national Seed Production	B,E1,H	1 Agronomist	sp	60,000 p.a. 30,000 p.a.	1976 1981	Canada Belgium(AGCD)
3. Nepal	Support for Nepalese Potato Programme	B,E1,H,I	1 Agronomist	sp	250,000/ '78-81	1976 1981	Switzer-land
4. Bangladesh	Support for Bangladesh Potato Programme	B,E1,H,I		administered by IADS			World Bank
5. Central America	Regional Collaborative Research Project	B,C	1 Agronomist 1/	sp	1,900,000 (5 years)	1979 1984	Switzer-land
6. Kenya	Regional Research Programme	C,E1,G,H, I	1 Agronomist 1 Assoc.Agronomist	c	180,000 p.a.	open	Assoc.Scientist-Netherlands
7. Turkey	Regional Research Programme	C,D,E1,G, H,I	1 Agronomist 1 Assoc.Agronomist	c	218,000 p.a.	open	Assoc.Scientist-Netherlands
8. Turkey	Tuber Seed Multiplication	C,E1,H,I	1 Agronomist	rc		1979 1981	Germany

1/ until June 1980

Table 11 :

CIP Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
9.	Philippines	Regional Research Programme	C,D,E1,G,H	1 Agronomist	rc	175,000 p.a.	open	Australia
10.	Colombia	Regional Research Programme	C,E1,G,H,I	1 Agronomist 1 Assoc.Agronomist	c	190,000 p.a.	open	Assoc. Scientist Belgium
11.	Costa Rica	Regional Research Programme	C,D,E1,H,I	1 Agronomist 1 Agronomist on sabbatical	c	114,000 p.a.	close 1981	
12.	Pakistan	Regional Research Programme	C,E1,H	1 Agronomist	c	120,000 p.a.	open	
13.	India	Regional Research Programme	C,E1,F,H,I	1 Agronomist	c	110,000 p.a.	open	
14.	Turkey	Tuber-moth Research	D	1 Post-doc.	c		1979 1982	
15.	Philippines	Testing of Agro-economic Technology	D,E1	1 Post-doc.	c		1980 1982	
16.	Rwanda	Role of Potatoes in African Diet	D	1 Post-doc.	c		1980 (5 months)	
17.	USA; Cornell Univ.	Utilization of Solanum andigena Germplasm in Potato Improvement	E2		c	73,000 p.a.	open	

Table 11 :

CIP Off-Campus Activities as of June 1980

	Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
					Type	Amount $	Duration From To	
18.	USA; N.Carolina Univ.	Use of Diploid Potato Species in Breeding	E2		c	23,000 p.a.	open	
19.	USA; Wisconsin Univ.	Developing Resistance to bacterial Wilt & Adaptation to tropical Conditions	E2		c	34,000 p.a.	open	
20.	USA; Wisconsin Univ.	Use of 2n Gametes in Breeding	E2		c	18,000 p.a.	open	
21.	Canada	Response of Tuberosum Genotypes to Environm. Stress	E2		c	12,000 p.a.	open	
22.	Netherlands; Wageningen	Use of wild Species in Breeding	E2		c	25,000 p.a.	open	
23.	Netherlands; Wageningen	Breeding for Eelworm Resistance	E2		c	22,000 p.a.	open	
24.	Germany; Braunschweig	Use of Electrophoresis for Clonal Determination	E2		c	24,000 p.a.	open	
25.	Germany; Univ.Hohenheim	Physiological Studies on Tuberization	E2		c	13,000	1978 1980	

Table 11:

CIP Off-Campus Activities as of June 1980

Location	Off-Campus Activity	Categ.	Senior Staff	Funding			Donors
				Type	Amount $	Duration From To	
26. Argentina; INTA	Use of major Variability for Potato Breeding	E2		c	10,000 p.a.	open	
27. Colombia; ICA	Evaluation of Resistance to Pseudomonas solanacearum	E2		c	6,000	1980 1983	
28. Australia; Victoria	Germplasm Multiplication for Southeast Asia	E2		rc	48,000	1978 1983	Australia